PROVIDE BY PARACHUTE: AIRDROP IN VIETNAM, 1954-1972

A MONOGRAPH
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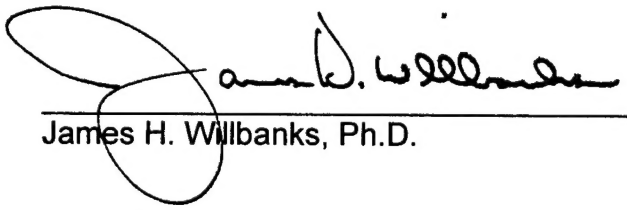

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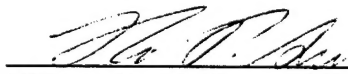

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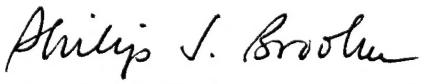

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ABSTRACT

PROVIDE BY PARACHUTE: AIRDROP IN VIETNAM, 1954-1972 by Major John A. Tokar, USA, 67 pages.

The study of history is a resource that most agree is critical to the betterment of any organization. The U.S. Army has always embraced military history, and by studying the "lessons-learned" from past wars and operations it improves its ability to perform in the future. However, the bulk of rewarding historical military study and education has been devoted to combat operations, at the expense of other fields, such as logistics. Moreover, there has been sparse accounting of logistical operations during the Vietnam War. The use of airdrop was not widespread in Vietnam, but significant developments in aerial resupply doctrine and technology were experienced. This monograph analyzes the airdrop operations at Dien Bien Phu in 1954, Khe Sanh in 1968, and An Loc in 1972, and presents the doctrinal and procedural evolution that occurred in each. All three battles presented unique challenges to the logisticians tasked to resupply the beleaguered forces, and the solutions that emerged were equally remarkable.

The story of aerial resupply, tactical airlift, and airdrop in Vietnam is largely a story of success in a place and time where (at least strategically and politically) there were few positive achievements. Many of the ideas and tenets employed to relieve besieged forces there were the result of the resourcefulness and ingenuity of Army and Air Force logisticians and aircrews. Some of these methods were incorporated into procedures for future use, but many were not. This study captures these experiences, through an historical analysis of the missions themselves, with the intent of improving the current logistics posture of U.S. forces and their ability to "provide by parachute."

The U.S. military currently operates in a rapidly changing security environment and is expected to perform non-traditional roles in addition to its conventional warfighting focus. In order to optimally carry out its assigned tasks, the Army, to include its logisticians, must have doctrine that is specific and applicable to its conventional missions, yet flexible enough to be useful in unexpected circumstances. Furthermore, the Army must take full advantage of available technology, and where relevant, incorporate it into its tactics and methodology. Army doctrine and methodology has not, unfortunately, fully benefited from the airdrop experiences in Vietnam.

Table of Contents

Chapter 1 – Introduction

"These questions must be studied, for the conditions they reveal should be the basis of all fighting methods, past, present and future.... For the smallest detail has its importance, secured from participants and witnesses who knew how to see and knew how to remember.... We want to know how man fought yesterday...did he follow, make light of, or forget the methods prescribed or recommended?" Ardant Du Picq, Battle Studies[1]

Although there have been countless studies of the Vietnam War conducted during the last three decades, relatively few authors have devoted more than a few cursory pages to the logistical aspects of the conflict. This apparent disdain for the analysis of logistical history is not confined to analyses of Vietnam, however. Military and civilian historians, as Martin Van Creveld notes "...are especially prone to overlook the role of logistics."[2] Furthermore, there is seemingly even less interest in studying the lessons-learned from supply operations in Southeast Asia in the centers of *military* learning. Ironically, a war in which over 58,000 Americans lost their lives, and which took place during the lifetimes of most serving officers, occupies only *four hours* of formal instruction during the entire year of the U.S. Army Command and General Staff College. As one might expect, none of that time is specifically devoted to logistical aspects of the war. This has resulted in the fact that today, few officers can completely appreciate the efforts of the sustainers and maintainers who served in Vietnam. More importantly, the Army has failed to fully incorporate the experience and wisdom gained by these men and women during that long, arduous campaign into its professional body of knowledge.

Human nature, particularly that of American soldiers, displays a marked aversion to studying failure. This is somewhat distressing because military failures provide with far more teaching points and lessons than do victories. This aversion to failure, though, may explain in part why more emphasis is not placed on the study of the Vietnam War in certain military circles. Perhaps the U.S. Army, as an institution, is not yet distanced enough from the conflict to analyze it objectively. Moreover, many critics believe that the Vietnam experience was a military anomaly, and that there are few valid lessons to be learned from it. However, the story of aerial resupply, tactical airlift, and airdrop in Vietnam is largely a

story of success in a place and time where (at least strategically and politically) there were ultimately few positive achievements. Much of what was learned in the field of aerial resupply in Vietnam was not established procedure or doctrine at the time. Many of the ideas and tenets employed to relieve besieged forces were developed in-theater by the men in airdrop support units and the pilots and crews who flew air transport missions. Some of these methods were incorporated into procedures for future use, but many were not. This study will capture these experiences, through an historical analysis of the missions themselves, with the intent of improving the current logistics posture of U.S. forces and the ability to "provide by parachute."

Ardant du Picq's words of over a century ago, as previously noted, describe the purpose of this study with excruciating clarity. Today's military must have the capacity to examine past actions with an eye toward understanding if our predecessors followed the established doctrine and procedure of their own time. If the Army is to benefit from this pursuit, accuracy is imperative. This monograph is an examination of aerial resupply in Vietnam and a judgement of the impact—positive and negative—that airdrop operations have had on current applicable doctrine and procedures. The first step, then, is to explain the current doctrine and TTP (tactics, techniques and procedures) that apply to logistics, generally, and airlift and airdrop operations, specifically.

Several key battles in which aerial resupply was extensively used and was critical to the end result will be then be scrutinized. The French experience at Dien Bien Phu, despite the eventual outcome, was a watershed operation in terms of utilization of tactical airlift and the airdrop of supplies to beleaguered forces. That there was substantial U.S. military support to the French airdrop effort should have served American forces better in the following decades, but the experience was insufficiently documented. Next, a study of the U.S. Marines at Khe Sanh in 1968, and how tactical airlift and airdrop kept them alive after their ground line-of-communication was severed, reveals many lessons that shaped the future of aerial resupply methodology. Finally, in the final stages of American involvement in Vietnam, the struggle to save the city of An Loc in 1972 showed both the inherent problems associated with aerial resupply and the lengths to which logisticians would go to in order to sustain those in need.

The distinct circumstances surrounding each episode shed light upon a wide variety of challenges faced when utilizing tactical airlift for logistical purposes.

Finally, the monograph will conclude with an analysis of how these experiences shaped and continue to shape future aerial resupply doctrine and airdrop procedures, not only in an overt combat environment, but also in other roles, such as humanitarian relief. In today's rapidly changing security environment, logisticians must grapple with missions that are varied and complex. Armed forces seldom have the luxury of time to fully develop new technologies and refine procedures after a conflict or peace operation has commenced. The proper time to perfect aerial resupply capabilities and doctrine is between times of need, because airdrop is almost inevitably considered and utilized in emergency situations, when all other avenues of resupply have been attempted. This normally means that lives are at stake, and today that implies that civilian as well as military casualties will mount if relief is not immediately available. By being in touch with its past, the U.S. Army can ensure that it is well prepared for the future.

Chapter 2: Airdrop Doctrine and Methodology

"I don't know what the hell this 'logistics' is that Marshall is always talking about, but I want some of it." Fleet Admiral E.J. King, 1942.[3]

The doctrine of the United States armed forces serves a dual purpose. It is a guide for the conduct of operations which must be specific enough for those situations the Army is expected to encounter, yet general enough to help shape decisions made under unique circumstances. Today's leaders generally agree that doctrine is not a template that is carried into battle, and it does not have answers for every conceivable situation. U.S. doctrine is intended to serve as a starting point and a frame of reference to provide the leader and the soldier with the best possible chance for success in all conditions. The Army's capstone doctrinal manual, *FM 100-5: Operations*, claims to be ever evolving — looking to the future yet able to capture lessons learned from past conflicts. Furthermore, and of particular relevance to the airdrop field, U.S. Army doctrine writers assert that history and technology profoundly affect its development.[4] Aerial resupply is a relatively new arm of logistics, and it has been acutely affected by technology over the last fifty years, as both aircraft and the methods of airdrop have continued to evolve. Doctrine is constantly challenged to keep pace with this evolution.

Doctrine that affects airdrop operations is unique because it is drawn from a combination of sources: Army, Air Force, and the Joint Staff. The Army uses the term "combat service support (CSS) characteristics" when describing tenets that apply to logistics. The Air Force calls them "logistics concepts," and joint doctrine rolls them up into "principles." These characteristics, concepts and principles provide a framework for describing the requirements of support. The Army's base doctrinal document, *FM 100-5*, describes the tenets of Army doctrine—agility, initiative, depth, versatility, and synchronization. These are essential to all successful operations. *FM 100-10: Combat Service Support* links these operational tenets with the fundamental characteristics of Army logistics: responsiveness, anticipation, integration, continuity, and improvisation. Additionally, *FM 100-10* relates the Army's CSS characteristics to the joint logistics principles outlined in *Joint Publication 4-0: Doctrine for Logistic*

Support of Joint Operations. The joint principles are responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability. The Air Force equivalent of *FM 100-5* is *Air Force Doctrine Document (AFDD) 1: Air Force Basic Doctrine*. The Air Force's manual for logistical doctrine, *AFDD 40: Logistics* supports the basic doctrine and mirrors the joint logistics principles. The British Army, furthermore, utilizes similar logistical principles: foresight, economy, flexibility, simplicity and cooperation. Since airdrop operations are always joint, and sometimes multinational, a combination of elements from all the above sources can be useful when examining airdrop operations and airdrop doctrine.[5]

These doctrinal sources provide the *criteria* for analyzing airdrop operations of the past and the effectiveness of methods employed. Comprehensive written logistical doctrine, as we know it today, was practically nonexistent in Western armies of the Vietnam era. Supply operations were recognized as critical to overall success, but they were not studied with the same discriminating eye toward improvement that combat operations received. Therefore, *today's* logistical theory, doctrine and procedures are the best benchmarks by which we may study logistical operations of the past. Furthermore, this same doctrinal analysis is helpful in determining if our current procedural guidelines (to include doctrine and techniques) incorporate the essential elements required for future success. For the purposes of this monograph, the characteristics, concepts and principles from the sources described in the preceding paragraph can be combined to form a few *essential* criteria for examining the effectiveness of past operations. These are **responsiveness**, **flexibility** and **continuity**.

Responsiveness is the keystone of U.S. armed forces logistical doctrine: "...all else becomes irrelevant if the logistic system cannot support the concept of operations of the supported commander."[6] In essence, it entails getting the right support to the force at the right time. The concept of responsiveness includes elements of many other principles, particularly anticipation and foresight. Logistical responsiveness means having the ability to anticipate the requirements that the supported force will have, and having the foresight to develop and attain the means to accomplish the supply mission. The scope of this principle extends from pre-conflict acquisition and development through termination, and it

encompasses all the other logistics principles. *Flexibility* includes elements of cooperation, improvisation and integration. Logisticians must be able to adapt their means of support to the changing conditions on the battlefield. Redundant capabilities are an important element of flexibility, particularly in airdrop operations. Aerial resupply, joint by definition, requires Army logisticians to be completely integrated with the sister services, as well as with the supported combat arms commander. *Continuity*, finally, is a principle that combines sustainability and survivability, among other elements. CSS operations do not cease when combat ends. Support is required before and after the conflict, and some logistics functions are actually heavier when the combat force is not actively engaged. The ability to maintain uninterrupted support of the combat force is critical to mission success, and it is particularly important when airdrop is the only means of resupply. These three principles are not exclusive to airdrop operations, nor are they the only required elements for success, but they are vital considerations in aerial resupply if the combat commander is to be effectively supported.[7]

The requirement to operate effectively as a joint force has become critical as the U.S. military has become leaner and relies more heavily upon power projection. As previously mentioned, airdrop operations, more than other operational and logistical endeavors, are inherently joint. Army and Air Force personnel must work together to accomplish the mission and this relationship produces benefits. Parachute riggers and support personnel have comfortably operated in the joint arena since the earliest days or aerial resupply. From the perspective of the parachute rigger, the current trend toward "jointness" in nearly every aspect of military operations is nothing new. The obvious reason is that aerial resupply is inseparable from its method of delivery—aircraft. The significance of this for logisticians, and any commander, staff or unit that may have to rely upon airdrop for success or survival is that efficient use of this means of resupply requires familiarity with not only Army doctrine, but also with Air Force and joint doctrine as well. Reliance upon a resource without knowledge of its capabilities and limitations is dangerous in today's rapidly changing security environment. An analysis of what airdrop can and cannot do exposes the extremes of logistical capabilities. It is a unique method that can influence the battle when all other forms of resupply have failed, but it consumes many other resources, and is, ultimately, a rather

inefficient mode of transportation. Therefore planners must carefully weigh its strengths and weaknesses prior to committing to its use.

Each service has unique roles and responsibilities in the conduct of airdrop operations. Starting in 1940, as the world prepared for war, the U.S. Army identified the need, developed the techniques and procedures, and began purchasing the equipment necessary to conduct airborne and airdrop operations. The accomplishments of the U.S. military during this period were truly remarkable. However, airdrop capability was still largely constrained by technology. Developments continued to progress throughout the Korean War, driven primarily by changes in aircraft design. During this period, the responsibility for developing aerial resupply doctrine and training parachute riggers was transferred from the Infantry Center at Fort Benning, Georgia to the U.S. Army Quartermaster Corps, headquartered at Fort Lee, Virginia. Quartermaster airdrop units were formally organized, and were awarded specific Tables of Organization and Equipment (TOE). These units remained largely unchanged in their structure and mission throughout the Korean and Vietnam Wars, until being reorganized in the late 1980's.[8]

The Army identified the need for standardized airdrop planning factors in 1983, more than forty years after commencing airborne operations. The Office of the Deputy Chief for Logistics (ODCSLOG) and the Quartermaster Center and School compiled a set of factors for use in planning airdrop resupply operations. They were published for the first time in 1987 in *FM 101-10-1/2: Staff Officer's Field Manual: Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*, which was last revised in July 1990. The factors are divided by class of supply and geographical region of employment, and while *not* a fail-safe method of computing battlefield requirements, the figures provide a reference with which to begin planning airdrop resupply. Furthermore, the manual provides the anticipated recovery rates for air delivery equipment.[9] As will be shown in the following chapters, French and American forces in Vietnam desperately needed this information, but it was not available to logisticians of that era because it had not yet been developed.

Combat requirements ultimately shape the size of the force, and the above-mentioned planning factors shape the type and amount of airdrop support that the Army has in its force structure today. The

employment of these units is described in the *FM 10-500* series of field manuals. *FM 10-500-1: Airdrop Support Operations in a Theater of Operations* identifies when and how the Army will conduct airdrop operations. It outlines the doctrinal conduct of airdrop operations and defines parachute rigging and aerial delivery as a primary field service. Airdrop will normally be utilized to resupply units in the division area, or forward of the Forward Line of Troops (FLOT) for special operations forces, although emergency airdrop resupply operations can conceivably be conducted anywhere in the theater. The primary advantage of airdrop, according to *FM 10-500-1*, is that it can be utilized when all other means of transportation have been exhausted. The disadvantages, however, generally outweigh the advantages, accounting for why it is usually considered as a last resort for resupply operations by commanders and planners. Airdrop is also an inefficient use of airlift assets, since the rigging material occupies a significant amount of available space within the aircraft. Furthermore, the conduct of airdrop operations places these aircraft at severe risk to enemy air defense systems. Additionally, as both the French and Americans discovered, adverse weather can affect airdrop accuracy, and the enemy can often recover supplies if drop zones are not adequately secured.[10]

In 1995, two key sources were published that explained the tactics, techniques and procedures (TTP) of airdrop operations. The first was *Joint Publication 3-17: Joint Tactics, Techniques and Procedures for Theater Airlift Operations*, Chapter VI of which explains the methodology of airdrop in a broad, joint context. Considerable detail is provided, though, on subjects such as drop zone types and criteria. The Joint Staff published JP 3-17 in July 1995, and the Army quickly responded with a TTP manual of its own the following October. *FM 10-500-9: Tactics, Techniques, and Procedures for Quartermaster Airdrop and Airdrop Support Units* describes in detail the responsibilities of Army units and leaders in each step of the aerial delivery process. In general, the Army provides the equipment to be airdropped, rigs it according to joint service manuals, and moves the rigged items to the departure airfield. Although not officially responsible for loading the aircraft or actions during the airdrop mission, Army riggers have usually provided assistance in these areas. This trait is part of what makes airdrop truly a joint operation. *FM 10-500-9* also reinforces the planning data found in *FM 101-10-1/2*, and provides

details on the flow of airdrop requests as well as the retrograde of aerial delivery equipment within the theater.[11]

As the Department of Defense becomes more closely knit, its sources of doctrine and methodology become increasingly similar. This is especially true in logistics, and particularly in the field of airdrop. Since Army riggers have operated with their Air Force counterparts in a joint environment since the 1940's, this fact is not surprising. The primary benefit of this relationship is clear: it can serve as an example to elements of our diminishing defense force. A tighter relationship can only enhance the trust between the services, and between combat units and those that support them. A meaningful tool in the process of improving this relationship is having a doctrine that is sound and clear, and one that has categorically analyzed and incorporated the lessons of the past. The following chapters scrutinize the airdrop operations at Dien Bien Phu in 1954, Khe Sanh in 1968, and An Loc in 1972. Each operation presented unique challenges to the logisticians that were there, to be sure, but there were also startling similarities. Unfortunately, many of these lessons were not adequately captured and therefore were not incorporated into procedures and doctrine. By examining them now, perhaps the U.S. military can ensure that it does not "reinvent the wheel" in future operations requiring airdrop resupply.

Chapter 3 –Dien Bien Phu: Logistical Defeat

"If manpower and military hardware constitute the vehicle which applies the necessary force to win a war, logistics are the power plant and fuel which drive it. In the end, both the French 'vehicle' and its power plant were found wanting...." Julian Thompson, The Lifeblood of War.[12]

Historians have long considered the battle for Dien Bien Phu one of the most significant military engagements in history. Indeed, Stanley Karnow believes it belongs in a class with Agincourt, Waterloo and Gettysburg.[13] The 56-day siege of this small town in Southeast Asia would not, at first glance, seem to be the place of legendary fighting. In terms of sheer numbers of troops involved, it cannot compare with Stalingrad or Bataan, and by that measure it does not initially warrant inclusion in the annals of siege warfare. In fact, it would not even be counted as a major battle if not for the circumstances surrounding it. However, as the late Bernard Fall said "...that is exactly what it was, and in a way which makes it *one of the truly decisive battles* of the twentieth century..."(emphasis added).[14] A thorough examination of the French experience in Indochina, and the eight years of war preceding the pivotal battle in 1954, is not within the scope of this monograph. However, a certain amount of background data is necessary if one is to fully appreciate how the French forces came to find themselves in a remote valley in north-central Vietnam, completely surrounded by the Vietminh, and totally dependent upon airdrop for their very survival.

Logistics, in large measure, decided the outcome of the battle of Dien Bien Phu, from both sides of the battlefield. The ability of the Vietnamese People's Army (Vietminh), under General Vo Nguyen Giap, to resupply the four divisions surrounding the valley is as impressive as the French aerial resupply effort was flawed. The study of this battle from a logistical perspective, in particular the use of airdrop as a means of aerial resupply, is especially relevant to the American military. French and American experiences at Dien Bien Phu shaped U.S. logistical actions, positively and negatively, over the next twenty years in Southeast Asia, and continue to impact doctrine and procedures today.

Despite a lasting impression to the contrary, the United States was intimately involved in the First Indochina War. President Eisenhower supported the French effort to subdue Ho Chi Minh and his

People's Army. The Cold War was just beginning to 'heat up' in Europe, and the Eisenhower administration considered France's contributions to NATO pivotal to deterring Soviet aggression in Europe. As a result, he felt compelled to support their colonization efforts. Furthermore, it was believed that if Communism was allowed to make inroads in Indochina, it would be merely a matter of time before it spread to other Southeast Asian nations. But the U.S. was reluctant to commit ground forces, or even bombers and aircrews, to the fight in Vietnam. Public opinion was still influenced by the recent bitter memories of the Korean conflict, and without a coalition of nations, including Great Britain in particular, Eisenhower was unwilling to commit more. So instead of direct military support, he approved enormous amounts of financial aid, eventually funding more than eighty percent of the war's total cost.[15]

In early 1953, the U.S. offered France even more financial support if they could produce a sound plan for defeating the Vietminh. Before the State Department had received a response, however, the Vietminh initiated another offensive against the French. For a number of reasons, the French quickly needed a decisive victory over a large part of Giap's army. Interest in the war was waning not only in France and the United States, but among the North Africans and Vietnamese nationals that comprised a large part of General Navarre's forces in Indochina. The decisive battle that Navarre sought could only be realized, in his opinion, by forcing the Vietminh to accept a large-scale, set-piece battle. Since the People's Army usually avoided this type of fighting, preferring guerilla warfare, Navarre was compelled to entice them to attack. In the two years leading up to the climactic battle, the French tried unsuccessfully to get Giap to attack French strength, but the Vietminh would not "take the bait."[16] When Navarre finally decided to reoccupy the airstrip and village at Dien Bien Phu, deep within Vietminh-held territory, he believed his forces could conduct offensive operations from this outpost and strangle Vietnamese support channels (see Appendix B). The French entitled this concept the *Base Aero-Terrestre*, and it had seen success earlier in Vietnam and Algeria. It depended upon total dominance of the air and an efficient system of aerial resupply. Navarre correctly assumed that the Vietminh would fight to retain control of the Dien Bien Phu valley, but incorrectly judged the ability of Giap and the tenacity of the Vietminh soldiers.[17]

A combination of physical (geographic) and tactical conditions drove the need for aerial resupply at Dien Bien Phu. The village is located in a valley in northwest Tonkin province, straddling the main Vietminh supply routes between Laos, China and Vietnam. For the French forces, the valley was too far from their logistical bases near Hanoi and Haiphong to be supported by ground convoys. In their *Base Aero-Terrestre* concept, however, this was not a deterrent, because they had previously utilized airborne forces with success. The "de Lattre Line," which defined much of the Red River Delta, was the limit of French-controlled territory in 1953. Giap's army, local resistance, challenging geography and poor infrastructure prohibited the possibility of sending troops, armored vehicles and supplies overland to French outposts. The valley itself is roughly six kilometers wide and sixteen kilometers long. The surrounding terrain consists of heavy jungle and rugged mountains, some of which reach 1400 meters in altitude. The rainy season normally begins in April and lasts all summer, and the two months preceding the monsoon normally see low clouds and fog predominate.[18]

On 20 November 1953, French paratroopers secured the airstrip and nearby village of Dien Bien Phu (which translates to "Seat of the Border County Prefecture"[19]). They overcame the initial resistance from the Vietminh garrison, but by mid-December Giap's divisions were beginning to surround the valley. Attempts by French battalions to conduct offensive operations into the surrounding countryside met with severe resistance, normally in the form of ambushes, and the French quickly ceased offensive operations altogether. Vietminh forces were concentrated by the end of January 1954, but Giap did not order the all-out attack until mid-March. During the intervening two months, he attempted to disperse the French, an effort that Navarre unwittingly aided by sending out blocking forces to impede Vietminh advances. In early February, French forces were occupying six separate locations, none of which were mutually supporting. The Vietminh selected Dien Bien Phu for their main effort, and Giap's preparations were meticulous. With the support of nearly 100,000 laborers, his army hauled artillery, other weapons, ammunition and other supplies high into the hills surrounding the valley. The Vietminh's use of camouflage was textbook in its application, expertly disguising artillery and anti-aircraft emplacements, troop positions and supply routes.[20] In preparation for the main attack, Giap stepped up guerrilla actions

throughout the country in an attempt to draw more French forces away from the main outpost. Most significant were attacks at Cat Bi and Gia Lam airfields in the delta region, which destroyed at least two dozen aircraft and damaged many others using plastic explosives. These were assets that the under-resourced French could ill-afford to lose.[21]

During the second week of March, Giap's artillery commenced with heavy shelling of the relatively unprotected satellite positions, *Beatrice* and *Gabrielle* (see Appendix C). In preparation for the ground assault the Vietminh had also dug a tremendous network of trenches, tunnels and earthworks, some of which came within meters of French positions. The enemy had detailed models of the French positions and had rehearsed their attack. They laid siege to both airfields and the garrison, and commenced destroying the French artillery one piece at a time. As a result, the artillery commander, Colonel Charles Piroth, committed suicide in disgrace. Just before retiring to his tent and detonating a hand-grenade upon his chest, he stated, "I am completely dishonored. I have guaranteed de Castries that the enemy artillery couldn't touch us—but now we are going to lose the battle. I'm leaving."[22] On 14 March the deadly accurate Vietminh artillery closed the principal airstrip, then destroyed fourteen aircraft and two helicopters on the ground. The monsoon rains began in earnest on 17 March, which was the day the last transport aircraft to use the airstrip departed Dien Bien Phu. For the next ten days small planes were able to land at night to remove serious casualties, but the outpost was now completely dependent upon aerial resupply.[23]

The French employed several different types of transport aircraft, and there was a wide disparity in both the availability and quality of training of pilots and support mechanisms. The U.S. wavered when the French asked for more assistance. Eisenhower seriously considered employing combat forces directly in support of the French, but concurrent studies on the proper use of American military power convinced him to authorize only the lending of aircraft and logistical assistance. Major General James Gavin performed the Army's study under the direction of General Matthew Ridgeway, the Army Chief of Staff. Gavin's report concluded that eight U.S. divisions would be required to save the French outpost, at a minimum, along with thirty-five engineer battalions. The Air Force, in turn, decided that air power could

contribute to the ground campaign, but terrain, weather, the lack of "good" air targets, and poor targeting intelligence were factors that would limit air power's success. Eisenhower then directed the Chairman of the Joint Chiefs, Admiral Radford, to give the French whatever materials they requested.[24]

At the beginning of the campaign in 1953, the French had well over one hundred transport aircraft at their disposal, mostly C-47 Skytrains provided under the U.S. Mutual Defense Assistance Program. Before the initial drop in November 1953, the U.S. had also provided twenty-five C-47's from the Far East Air Forces (FEAF) in Japan. The C-47 could carry 9,000 lbs. of cargo or 25 paratroopers, and although most were aged airframes, they were a significantly better lift asset than the three-engine, German-manufactured Junker 52 that they replaced. In early April 1954, the French requested and received eighteen additional C-47's from FEAF, to replace those lost in combat. At the time of the cease-fire, there were 116 C-47's in Indochina, but dubious maintenance procedures and inadequate spare parts often kept more than fifty-percent of them on the ground. French mismanagement can be partly explained when one remembers that they did not have the extensive experience that British and American forces derived from airlift operations in World War II. However, another source of friction was that French pride often clashed with American experience when U.S. technicians attempted to change the status quo.[25]

The other workhorse of the transport fleet was the C-119 Flying Boxcar. The C-119 was far better suited for dropping heavy equipment and vehicles because it was equipped with a floor roller system and rear-opening doors that facilitated cargo extraction, and permitted loading and dropping of much larger cargo than the C-47. Furthermore, they could usually drop all of their cargo in one pass over the drop zone, while the C-47's could require ten passes to extract less cargo.[26] The French began asking the U.S. for C-119's as early as 1951and their total number varied from twelve to twenty over time. In December 1953, the 315th Air Division (Combat Cargo) from Japan began lending C-119's to the French, and training their aircrews how to fly them. A detachment from the 483rd Troop Carrier Wing and a provisional maintenance squadron deployed to Cat Bi airfield, outside of Haiphong, to provide additional support. In April 1953, six more C-119's were lent from FEAF to the French, this time with the intent

that civilian aircrews operate them. These crews were mostly American veterans, who were under contract to a private airline called Civilian Air Transport, Inc. (CAT). They were trained on the C-119 at Clark Field in the Philippines and promptly sent into action. The contribution made by these crews was significant. Their contracts made no mention of flying in combat conditions, but that is exactly what they did. They flew airdrop sorties at low altitudes in adverse weather and through hostile ground fire, but those were not the only hazards faced. The crews often reported that the French bombers and C-47's would drop flak suppression missions and cargo through their airdrop formations. The Vietminh eventually shot down one of the civilian flown C-119's with a 37mm gun. It was flown by a legendary figure known as "Earthquake McGoon," whose real moniker was James McGovern. McGovern was a veteran U.S. Air Force pilot from World War II, who had received his nickname in deference to his immense size and huge black beard. He died in the crash, along with four crewmen, one day before the surrender, on his forty-fifth mission over the outpost.[27]

Numerous other aircraft, ammunition, and supplies and support were provided by the United States to France. Chief among these for the Army was a detachment of the 8081st Quartermaster Airborne Supply and Packaging Company from Ashiya, Japan, which had gained considerable fame for its airdrop of bridging material in Korea. The exact number of U.S. riggers actually present in Indochina varies by source, but was probably around ten men. Positioned at Cat Bi airfield near Hanoi, they trained and supervised French and local national labor support to complete the rigging and loading tasks. They also routinely flew on airdrop missions to assist in cargo extraction. By mid-March 1954, they had supported the airdrop of 5,700 tons of equipment (mainly construction material, barbed wire and ammunition) into Dien Bien Phu and other locations. By early February 1954, Brigadier General Albert G. Hewitt, the commander of the Far East Logistics Force, deployed to Saigon to oversee this amalgamation of planes, aircrews, riggers, and maintenance and other support personnel. All the while, Eisenhower assured the American public that the sum of all *direct* U.S. involvement in Vietnam amounted to " 'some airplane mechanics...who would not get touched by combat.' "[28]

A variety of airdrop methods was employed to counter the effects of adverse weather and anti-aircraft fire. French forces at Dien Bien Phu required at least two hundred tons of supplies daily to maintain combat effectiveness, of which 170 tons were ammunition. (There is evidence that the French logistical staff was unable to predict this with any accuracy, however. The 200-ton figure comes from estimates made by American logisticians after the battle.[29]) Before the siege, most of this materiel was airlanded on the main strip. Before that was even possible, however, runway repairs had to be affected, and these began immediately after the second wave of paratroopers landed in November. The engineers urgently needed a bulldozer to adequately complete the repair mission, though, and two attempts were made to airdrop one that first week. The initial bulldozer airdrop malfunctioned, and the item was completely destroyed. The second was successful, and to date, was the heaviest single item ever airdropped in the Far East.[30]

Although still wedded to the concept of fighting a major battle with the Vietminh, Navarre soon realized that his initial plan of conducting a major offensive from Dien Bien Phu was impossible. The two patrol attempts that were made in December were rapidly beaten back into the garrison. However he continued to believe that his forces were only facing a single division, and that they could hold out indefinitely while he planned for operations further south. As a result, the French failed to reinforce or withdraw their forces during the next two months, and instead stagnated, allowing Giap to set the terms of battle. There were inadequate construction materials available in the area, and insufficient airlift to deliver what was required. What trees were available were soon cut down to reinforce bunkers, and all natural brush was consumed by cooking fires, leaving the entire French position without any natural camouflage. This allowed the Vietminh to pinpoint every position with artillery fire.[31]

During the siege, instead of the necessary 200 tons of supplies per day that were required, an average of only 120 tons was dropped. French forces probably never recovered more than one hundred tons per day, although that recovery percentage, if accurate, is remarkably good compared to previous recovery statistics from Korea and World War II. Making this accomplishment even more surprising is the fact that Vietminh artillery and mortar fire had destroyed nearly all the French vehicles at the outpost,

requiring that supplies be collected and distributed by soldiers on foot. Total airdrop numbers exceeded 30,000 tons in 1954 alone, with 7,000 tons dropped into Dien Bien Phu during the fifty-six days of the siege. Of the total, 19,000 tons went to other battlefields. French logisticians claim to have supported over sixty different outposts with aerial resupply during the latter years of the war. The cost was enormous, for none of the air items (cargo parachutes and A-22 containers) were returnable to the airhead during the siege. This cost the French nearly 200 million francs per day, and had the battle lasted much longer, the supplies transferred from the U.S. would have been totally consumed.[32]

To compound the difficulty already encountered due to poor visibility, weather, anti-aircraft fire and limited logistical expertise, the drop zones themselves were always shrinking. The steadily encroaching Vietminh gradually reduced the French footprint, eventually reducing the effective drop zone at the main garrison to a diameter of about 2,000 yards. Normal low-level supply drops were suicidal and therefore eventually stopped. Instead of ranging between 500 and 1000 feet, drop altitudes were initially increased to 2,500 feet, then to 6,000 feet and finally settled between 8,000 and 10,000 feet to escape the enemy flak. At this altitude, normal rigging procedures were inadequate, because a standard airdrop supply bundle would drift for approximately six minutes under the parachute canopy. This made accurate prediction of aerial release points nearly impossible, despite the claims of C-119 aircrews. An undated report from several pilots to the commander of the 315th Air Division stated that from 10,000 feet they could place cargo into a 330-yard square, yet the actual recovery data showed that only about one-third of the supplies were ever recovered from these drops.[33]

Controllers on the ground tried to aid the aircraft in adverse weather situations by tethering a weather balloon that floated above the clouds at a prescribed altitude to show the aircrews where to release their loads. The flak quickly drove the planes to the higher altitudes, however. French airborne technicians are credited with the solution that would prove effective, if not decisive, in countering the adverse weather and enemy anti-aircraft fire. The French had experimented with high-altitude airdrops as early as 1950, into the posts of Muong-Kia and Pho Lu, which had been ringed with effective Vietminh anti-aircraft fire. Airdrop technicians devised a mechanical system with a six-second delay in parachute

opening, which they used from the Ju-52s. But inaccuracies in the drop altitude and the length of free-fall, combined with irregularity in parachute deployment, made for disappointing results. The method was not explored any further until 1954, when the need again arose, at Dien Bien Phu.[34]

This time the French riggers employed a different technique. The method involved gathering (or reefing, in rigger jargon) the suspension lines of the cargo parachutes and tying them together at a certain point to limit the amount of air that the canopy could hold, thus accelerating the initial descent of the cargo load. The reefing line was secured using an explosive time-delay fuse, or cutter, that would fire at a prescribed length of time after the drop. Once the reefing line was cut, the parachute could then inflate to its originally intended diameter, thus slowing the cargo load to an acceptable speed to minimize damage upon impact. The system allowed for an opening delay of up to forty seconds, depending on the predetermined drop altitude. It consisted of a piece of folded cardboard, through which the reefing line passed, with the detonators placed inside the fold. Two slow-burning wicks were used, as well as an igniter. Initial drops were encouraging, when the system worked as designed. Unfortunately, hasty construction, inconsistent materials, malfunction of the detonators, and the "approximate" nature of the wicks caused losses of at least twenty to thirty percent. However, towards the end of the conflict it was the only method of airdrop that was available. The soldiers from the 8081st adopted the practice and used it on all C-119 drops during the last two weeks of the siege.[35]

Even with the new, improvised packing procedures, the troops on the ground were receiving less than half of the tonnage required to sustain themselves. The reliability of the explosive cutter was very suspect, and often it either failed to operate at all, causing complete destruction of the load upon impact, or it operated too soon, thus allowing the load to drift with the wind for an undetermined amount of time. These were perhaps the most frustrating of all malfunctions, because as a result, the beleaguered forces could actually watch from their positions as literally thousands of rounds of 105mm-artillery ammunition fell into enemy-held territory. The Vietminh soon redirected the missent ammunition to the French, because they, too, had 105mm guns. The final days of the battle were especially bloody, marked by intense artillery barrages by the Vietminh, and bunker to bunker fighting. Despite the incompetence of

certain senior leadership, and poor logistical planning and execution, the spirit of the average French paratrooper was nearly unbreakable. Their heroic performance has few parallels, but Giap and the Vietminh had more manpower, better logistics for the conditions, and superior generalship.[36]

Though the French reoccupied Dien Bien Phu for a total of 209 days, the actual siege lasted for only fifty-six, from 13 March until 7 May, when the remaining French surrendered at 1730 hours. The main garrison capitulated first, followed shortly after by the forces at position Isabelle. Total French losses were over 7,000 men killed, wounded or missing; about 6,500 were taken prisoner by the Vietminh. In the eight years the French had been fighting, they had lost a total of over 75,000 men dead or missing.[37]

Was the French aerial resupply system responsible for their defeat at Dien Bien Phu, and did the French, even with their American supporters, violate the principles of logistics as we have defined them today? *Responsiveness*, as described in Chapter Two, is the keystone of both Joint and Army logistics doctrine. The French logistical system failed primarily because it was not responsive to the changing conditions on the ground: it was not capable of giving the proper support to the right force at the right time. Part of that responsiveness depends upon having enough assets to support the commander's plan. The French did not have enough air transport assets to adequately supply the outpost, nor did they have sufficient bombers and attack aircraft to suppress enemy flak to allow their limited airdrop assets to operate as intended. Compounding the issue of quantity was that of quality. The French Air Force not only lacked the expertise of their British and American counterparts, but their logisticians were guilty of inadequate preparation. No record exists of them ever having computed a daily supply tonnage requirement, nor were required stockage levels computed and maintained at the airheads.[38] When conditions became critical, they did rise to the occasion by developing a high-altitude cargo delivery method, but it was far too late to impact conditions in the valley. Thus they exhibited some elements of the logistical principle of flexibility, but showed little ability to promote those of sustainability and survivability.[39]

The French lost to the Vietminh because they lacked the means to apply overwhelming force. A key part of that force was airlift and the ability to resupply by air. They felt that a large, set-piece battle against Giap's army would be decisive, and it was. It resulted in victory for the Vietminh because they had the logistical capacity to support the type of battle that they wanted to fight. The French, on the other hand, lacked a sufficient quantity of effective, organized logistical support that would enable them to win a battle in a location like Dien Bien Phu. Granted, aerial delivery was a science that was only fifteen years old, but many of their deficiencies occurred in planning and preparation. French commanders underestimated their tactical opponent, and French logisticians *did not estimate* the amount of support that would be necessary to maintain combat effectiveness if airdrop were to become the only method of resupply. They experimented with high-altitude dropping, but failed to fully explore the possibilities of free-dropping supplies, without the aid of parachutes (e.g. camouflage nets and certain types of food and water containers.) In the end, the requirements placed upon the airlift system were too great, despite the high level of American involvement, and they revealed the weaknesses in the existing airdrop methodology and the difficulty of recovering loads on the ground under fire. As the official U.S. Air Force history noted, "...A fundamental lesson learned was that last minute efforts to prop up an unsound airlift system are a poor substitute for prior and sustained development based on appropriate doctrine."[40]

Significant logistical lessons-learned during this conflict were thoroughly captured and documented by the French.[41] However, for unknown reasons, the U.S. military failed to adequately integrate the French airdrop experience into their own reports from 1953-54, nor is there any record of the Army using French airlift data while planning their own missions in Vietnam. Ironically, it was the high-altitude parachute reefing procedure developed here that would be reinvented eighteen years later to support the entrapped forces at An Loc, and again (in revised form) during the humanitarian airdrop in Bosnia in 1993-4.[42] Much of this experience could have improved airdrop operations at Khe Sanh, too, as the next chapter shall reveal.

Chapter 4 –Khe Sanh: Airdrop Comes of Age

"Never have the requirements for tactical airlift been more challenging nor their responses more gratifying." General William C. Westmoreland, 1968. [43]

The result of the application of airpower, particularly tactical airlift, was very different at Khe Sanh in 1968 than it had been at Dien Bien Phu fourteen years earlier. The battle for Khe Sanh was a thoroughly impressive use of logistical resources, and it resulted in a decisive tactical victory for the United States. However, many still believe that senior U.S. leadership needlessly wasted American lives defending an insignificant piece of terrain. As a result, the legend of Khe Sanh has taken on epic proportions. Although there were similarities with Dien Bien Phu and other classic historical "sieges," there exist many more differences, and as such, Khe Sanh does not fit the true definition of siege warfare. The defense of the outpost was a deliberate decision taken by the U.S. to engage the Vietminh in a set piece battle. The joint efforts of the Army, Air Force, Navy and Marine Corps were capable of drawing upon past lessons, and our forces used their imagination and creativity to successfully resupply the garrison and outlying positions. In the end, the United States mounted a successful defense of Khe Sanh because it had total air superiority and "...used an intelligent combination (of) heavy firepower and air lines of communication."[44]

Many misconceptions exist about the battle for Khe Sanh. A full understanding of the conditions that would eventually require the use of airdrop to resupply the garrison is necessary if one is to demystify Khe Sanh. The first fallacy supported by both journalists and some historians is that Giap intended Khe Sanh to be a diversion to draw U.S. troops away from the major cities in the south, which were Giap's real objectives of the Tet Offensive. If this were true, it was an extremely inefficient diversion, since 6,600 U.S. Marines and the Army of the Republic of Vietnam (ARVN) Rangers held the attention of over 40,000 premier People's Army (PAVN) combat troops. Moreover, despite media reports to the contrary, fighting was no fiercer at Khe Sanh than at other major Tet Offensive points. For example, casualties there were actually lighter than at Hue and Saigon. Daily losses at Khe Sanh averaged three killed and

twelve wounded, which is much fewer than losses suffered by many comparable units in "normal" combat operations. Furthermore, neither Westmoreland nor Lieutenant General Robert G. Cushman, the commander of III Marine Amphibious Force and the senior Marine in Vietnam believed that Khe Sanh was ever in danger of falling. On the contrary, Westmoreland saw in Khe Sanh the opportunity to utilize his greatest asset: overwhelming firepower. In the remote, relatively unpopulated Khe Sanh region, he could do this without the danger of intolerable collateral damage, against an enemy that was finally massing after years of frustrating infiltration and guerilla attacks. Additionally, Westmoreland firmly believed that the joint efforts of American logisticians could keep the garrison resupplied.[45]

The second major delusion fostered by the Johnson Administration and supported by many in the media was that Khe Sanh had become another Dien Bien Phu, and defeat there would mean total defeat in the war. "The parallels are there for all to see," Walter Cronkite reported to Americans in February 1968. The media's misconceptions swayed public opinion, which had a serious effect upon the political leadership. President Johnson became so obsessed with events at Khe Sanh that he had a scale model of the plateau built in the basement of the White House. He reportedly would study it late at night, in his bathrobe, while poring over aerial photos and casualty reports. Eventually, the President forced his Joint Chiefs to sign statements that they believed Khe Sanh could be held, stating, "I don't want any damn Dinbinphoo."[46]

In reality, however, the only similarities between the two battles were that a numerically superior force surrounded both forces, and both were totally dependent upon aerial resupply for their survival. The differences are numerous and notable. The U.S. Air Force and the logistical support system that included Army parachute riggers were far superior to anything the French had in 1954. More importantly, the Marines enjoyed a staggering advantage in firepower, to include B-52's and 175mm artillery. One result of all this firepower was that aerial resupply operations were never seriously hampered by enemy anti-aircraft artillery (AAA). Over 100,000 tons of bombs were dropped, in addition to over 150,000 artillery shells, during the 77 days of envelopment: "...a total of more than seventy-five thousand tons of explosives over a nine-week span—the deadliest deluge of firepower ever unloaded on a tactical target in

the history of warfare."[47] Had the French had similar assets at their disposal in 1954, their ability to resupply by air would have been greatly enhanced, and perhaps would have changed the outcome of the battle and the war.

Located in Quang Tri province, the Khe Sanh plateau rises above the coastal plain and is further ringed by higher terrain that held tactical significance in 1968. These peaks averaged fifteen hundred feet above airstrip elevation, with some in the north rising to four thousand feet. Either lush forests or elephant grass covered the terrain in 1968. The village of Khe Sanh was situated along Route 9, the northernmost east-west road in South Vietnam. The road, when serviceable, allowed movement westward into Laos. However, as a line of communication, Route 9 was treacherous even without an enemy presence. No fewer than eight bridges had to be crossed between the supply bases at Dong Ha and Quang Tri and the garrison at Khe Sanh. Moreover, Vietcong infiltrators repeatedly destroyed the ones that were not washed out by swollen rivers during the rainy season.[48]

French coffee planters had initially settled Khe Sanh in 1926, and it was the French who had made Colonial Route 9 the first hard-surfaced road from the coast to Laos. French forces eventually built a fort at the site to protect commerce along the route. Special Forces established the initial U.S. combat base in 1962 for the purposes of launching surveillance missions into Laos and for observation along the border. The airstrip and outpost at Khe Sanh had been occupied and abandoned several times since the U.S. had become involved in the conflict, and the U.S. seemed rather indecisive about the real value of the location. Nevertheless, Westmoreland decided that the reoccupation of Khe Sanh in 1966 would not only permit detection of large PAVN troop movements to the south, but that it would also deter enemy penetration into the populated coastal plain. Additionally, it could serve as a staging base should he be allowed to invade Laos and stop the flow of Communist logistics down the infamous Ho Chi Minh Trail.[49]

Weather and airfield geography played a critical role in the ability to resupply Khe Sanh by air. The historical weather data that was available indicated that aircrews could expect cloud ceilings below one thousand feet and visibility of less than two and one-half miles on more than half of the mornings

between November and April. Conditions gradually improved as each day wore on, however. The approach and landing difficulties were also notorious. The runway was situated at 1,500 feet above sea level, on an 800-foot rise. As a result, pilots had difficulty judging heights since ground references were absent when landing from the east. The runway was 3,900 feet long, sixty feet wide, and had no parallel taxiway, thus requiring the C-130's to make a 180-degree turn at the end of the runway and taxi back to the download area. This exposed them to even more ground fire. Moreover, the winds were often unpredictable. These factors resulted in many abrupt landings and an increased reliance upon aircraft braking. This contributed to the deterioration of an airstrip that was already in an extremely fragile condition. Although Navy Seabees had worked feverishly throughout 1967 to upgrade the airstrip, weather either accounted for the closure of Route 9 or the inability to supply necessary materials (specifically perforated aircraft matting) by air.[50]

In December 1967, MACV became aware that North Vietnam was beginning to concentrate troops in the Khe Sanh area. Although Westmoreland was aware that the Marines at Khe Sanh were severely outnumbered, he chose to fight instead of abandoning the garrison. This was the type of engagement that he and his staff had long anticipated, and they knew that they could resupply the Marines by air. In *A Soldier Reports*, Westmoreland claims to have requested an airdrop support company as early as 1965 for just such a contingency. Furthermore, he recognized that one of the key differences between Khe Sanh and Dien Bien Phu was the presence of the more robust airdrop support capability.[51] Some critics have proposed that since he also knew that he was departing Vietnam in 1968 to become the Chief of Staff of the Army, Westmoreland also viewed Khe Sanh as a sort of "swan-song" engagement. Nevertheless, Giap's forces were in place by early January 1968, and what had been sporadic shelling up until that time greatly intensified on the nineteenth of that month. Intelligence reports were relatively accurate, though, and the Marines were well prepared logistically, at least at the outset. Food, fuel and ammunition were stockpiled in quantities that could last thirty days.[52]

On 21 January, however, an event occurred that would radically alter the logistical plan. Around dawn, the NVA artillery detonated the main ammunition dump, resulting in the destruction of over

fourteen hundred tons of munitions. Emergency resupply was immediately requested, and C-123's began to airland ammunition almost immediately. For the next eight days, the Air Force airlanded an average of 250 tons per day, utilizing C-123, C-130, and C-7A aircraft. These aircraft were all strafed by small arms on their approaches, however, and the incessant artillery and mortar fire had damaged the runway extensively. The weather continued to worsen in early February, allowing planes to land only forty percent of the time. The ground approach control unit was destroyed on 7 February, which severely restricted the number of C-130 landings. By 10 February at least seven C-130's had received minor to severe damage, but none had yet been destroyed. Then, on the tenth, disaster struck. A Marine KC-130 loaded with fuel bladders was struck by small arms fire during its approach. The cargo compartment burst into flames, and although the crew managed to land the plane, two crewmen and four passengers perished in the blaze.[53] The situation worsened when the plane rolled to a stop at the end of the runway, and there it remained, to serve as a backdrop for every television camera crew that came to report on Khe Sanh for the American public. Thus, it became a symbol for those who wanted to believe that defending Khe Sanh was folly, soon to be Dien Bien Phu—Part Two. Westmoreland himself bemoaned the presence of that fateful airframe: "That one unfortunate C-130 became the world's most photographed aircraft."[54]

Unlike the French in 1954, there were few constraints on the number and types of aircraft available for use at Khe Sanh. The Lockheed C-130 Hercules was the newest and most advanced tactical airlift aircraft to date and it offered several advantages over the C-123, the C-7A and other transport aircraft. It could carry significantly more tonnage, could fly faster, and was equipped with more modern and more accurate navigation equipment. However, it was also heavier, took a longer distance to come to a complete stop, required more ramp space to turn and offload, and cost over $2.5 million each. The C-130 needed 2,000 feet to slow down after landing, and therefore at Khe Sanh, it was forced to continue to the end of the runway, execute a 180-degree turn, and then proceed back to the offload ramp. The jet equipped Fairchild C-123K Provider, in contrast, could slow down quickly enough to allow a 90-degree turn at one of two turnoffs that led to the download area, thus exposing itself to far less enemy fire.[55]

It was primarily for financial considerations, though, that on 12 February, Air Force General William W. Momyer, commander of the Seventh Air Force, directed that C-130's would no longer be used for airlanding supplies at Khe Sanh. They would shift, instead, to airdrop missions. Momyer was exercising authority over *all* air assets in Vietnam, which came as a result of a heated debate involving the chiefs of all the services. Westmoreland felt very strongly that he needed a single manager for all air assets in theater, and Momyer was the logical choice. However, the Marine Corps had a long history of closely guarding their organic air assets, and had no intentions of giving up control to the Air Force. Even the Army Chief of Staff, General Harold K. Johnson, disagreed with Westmoreland's decision, fearing the Army would lose its helicopters for good. Westmoreland was adamant, however:

> "That was the issue—the one issue—that arose during my service in Vietnam to prompt me to consider resigning. I was unable to accept that parochial considerations might take precedence over my command responsibilities and prudent use of assigned resources."[56]

Eventually, Westmoreland won out, and Momyer's ability to exercise centralized command and control has been viewed by most historians as extremely effective.

Once the decision was made to resupply the garrison primarily by airdrop, logisticians had to decide upon the best method to employ. The goals of the effort were clearly established by (then) Brigadier General Burl W. McLaughlin, commander of the 834th Air Division at Tan Son Nhut Air Base. The logistical effort would have to guarantee uninterrupted aerial resupply, regardless of enemy fire and weather problems, minimize the exposure of aircraft and crews to hostile fire, and minimize load recovery problems for the Marines on the ground. Airdrop would be the means employed to deliver ammunition, fuel and rations, in that order of priority. Airland operations were only considered for those items not airdroppable. Personnel, medical supplies and special ammunition (e.g. fuses) were the primary airland cargo, and of course, departing airframes were loaded with casualties. Logisticians from III MAF confirmed that the daily requirement for resupply would be 235 short tons. Only eighteen tons of this requirement would be for day-to-day consumption. The remainder would be to build up stocks for the rest of the month, in an attempt to replenish what had been destroyed in the ammunition dump explosion.

This total amounted to approximately sixteen C-130 loads daily, and this general goal would remain in effect for the remainder of the operation.[57]

U.S. Army parachute riggers had been in theater for several years, although their efforts before Khe Sanh were largely confined to limited resupply activities and support of special operations. (A notable exception was the only large conventional airborne operation of the war, Operation Junction City in 1967.[58]) MACV decided in early 1966 that they needed a larger airdrop capability in Vietnam. The 383rd Quartermaster Detachment (Aerial Supply) had been in country since August 1965, but their doctrinal capability was only fifty short tons per day. MACV logisticians had determined that the new airdrop requirement was 250 short tons per day, and that it had to be sustainable for at least thirteen days. A provisional aerial delivery company was formed in Saigon using the 383rd as a nucleus, and was augmented with organic riggers from airborne units already in country. The 109th Quartermaster Company (Air Delivery) from Fort Campbell, Kentucky arrived in Vietnam in 1966, and was fully operational at Cam Ranh Bay by November, when the provisional unit was inactivated.[59] The 383rd remained in Vietnam, and eventually relocated to Bien Hoa. The 109th was responsible for parachute packing, storage and limited maintenance of aerial delivery equipment, and rigging of supplies for airdrop. In support of the airdrop effort to Khe Sanh, the 109th dispatched an element to the 1st Corps Tactical Zone (CTZ), where they established a rigging line at Da Nang. Soldiers and riggers of the 549th QM Company, who were stationed in Japan, augmented their efforts there. This forward logistical base significantly shortened the flight time of supplies to Khe Sanh.[60]

One of the most critical actions of the 109th and the other units that supported them actually took place before the NVA surrounded the Marines at Khe Sanh. Between September and November of 1967, while the Marines and Seabees were improving the outpost, airlifters recognized that the runway surface would have to be substantially improved if C-130's were going to be able to land safely. Thus began the largest sustained use of LAPES in military history. LAPES and CDS missions dropped nearly three hundreds tone each of AM-2 airfield matting and asphalt. The later defense of Khe Sanh would not have been possible were it not for this successful operation. The riggers and aircrews learned invaluable

lessons about the new, nonstandard system that they then incorporated into their procedures. Having the opportunity and ability to conduct the operation under relatively permissive conditions greatly improved future logistical posture. The effort also garnered enormous praise for the combined rigging effort from Westmoreland and others. In September 1967, the 109th earned a letter of commendation from the Deputy Commanding General of MACV, Lieutenant General Bruce Palmer, who stated "...the professional rigging which assured the successful delivery of the AM-2 matting by LAPES (was) truly outstanding.... The results of this operation will be invaluable to future staff planning and operational missions involving aerial delivery."[61]

Although not a doctrinal duty, members of the 109th, 549th and the 383rd routinely helped the Air Force load aircraft, and often flew on missions to assist in the dispatching of supplies and to correct rigging problems in-flight should they occur. Additionally, the army riggers would often assist with unloading supplies on airland missions. This provided opportunities to collect used air items and return them to Cam Ranh Bay for maintenance and repacking. On October 15, 1967, while attempting to free-drop sandbags into Khe Sanh, Specialist Charles L. Baney, a rigger from the 109th, was killed when the aircraft crashed in poor visibility. He was posthumously promoted to Sergeant and inducted as a Distinguished Member of the Quartermaster Regiment in 1996. Less than half of the personnel in conventional "rigger" units were actually parachute riggers by Military Occupational Specialty (MOS). The bulk of the unit consisted of other supply, maintenance and transportation MOS's, and these personnel were invaluable to the successful completion of the mission. This fact has remained unchanged since the inception of airdrop units.[62]

The combination of aerial delivery methods employed to resupply Khe Sanh reflected the creativity and ingenuity of both Army and Air Force logisticians. Techniques utilized combined old and new airdrop technology. These included the Container Delivery System (CDS), Low-Altitude Parachute Extraction System (LAPES), and the Ground Proximity Extraction System (GPES). The modular platform airdrop system was also available but was not used at Khe Sanh due to the limited size of the drop zone and the increased risk of exposure to enemy fire at the higher required drop altitudes. CDS was

a proven airdrop system and accounted for the majority of the tonnage airdropped in Vietnam. Supplies weighing up to a ton were gathered in a nylon and cotton container system and placed on a plywood skid. Attached to cargo parachutes, 14-16 of these "bundles" would be released on rollers inside a C-130 to gravity feed out the rear of the aircraft as the pilot raised the deck angle at a designated point. However, the drop zone at Khe Sanh presented unique problems. At 300 x 300 yards, it was smaller than a standard CDS drop zone, and it was also outside the established defensive perimeter. The Marine commander did not want to risk damage to personnel, structures, or the airstrip that might be caused by errant loads. Moreover, they did not want to close the airstrip each time an airdrop was scheduled. This required the Marines to secure the drop zone for each airdrop, and they had to dodge incoming artillery and mortar rounds while trying to collect the supplies.[63]

The 109th QM Company had been participating in the development of LAPES since 1955. This airdrop technique involved flying the aircraft at approximately five feet above the airstrip. A 28-foot extraction parachute, constrained or "reefed" to a 48-inch diameter and secured to the load, would be released out the rear of the aircraft. At this point, the tension on the load was not enough to extract the load. However, at a predetermined point, the reefing could be released by the loadmaster by way of a electronic release switch, thus allowing the canopy to inflate to its full 28-foot capacity. Under this increased drag, the load would release from the locking rail system, the aircraft would literally fly away from the load, and it would slide to a stop on the ground. This method was perfected in the late 1950's and early 1960's, but was not used in combat until Khe Sanh. Because of the weight and bulk of items such as timber and aircraft matting, the LAPES method was preferred when large, heavy items were required, but during 1967-8, LAPES was still considered a non-standard load. LAPES equipment was in short supply and stocks were controlled by the Air Force. The Army recognized the benefits of the system, but no formal decision had yet been made to permanently retain it.[64]

LAPES had inherent risks. The aircraft was required to fly at an extremely low altitude, requiring more precision on part of the aircrew, and exposing the aircraft to ground fire. Additionally, as the load slid to a halt, it often would damage the aircraft matting of the runway, and predicting the actual point

where the load would stop could be difficult. On 21 February, a C-130 attempting a LAPES drop accidentally touched the ground, tearing the cargo ramp from the aircraft. The LAPES sled extracted early, killing one Marine and injuring another. Nearly a month later, another LAPES malfunctioned. The parachute on this load failed to deploy properly. The eight-ton slab overshot the LAPES zone, slid into a bunker and killed another Marine. Intense friction resulted between some Marines and the aircrew and riggers who were subsequently forced to spend time on the ground at Khe Sanh, although most of the Khe Sanh garrison sincerely appreciated the efforts being made by the logisticians. LAPES missions were limited toward the end of the operation due to shortages of certain rigging items. Attempts were made to recover used equipment from Khe Sanh, but on 8 March, ten sets of components awaiting airlift at the outpost were destroyed in a mortar attack. Nevertheless, the method was extremely effective overall, and no fewer than fifty-two successful LAPES deliveries were made at Khe Sanh.[65]

The Ground Proximity Extraction System (GPES) was actually the developmental precursor to LAPES. Similar to LAPES procedures, the aircraft flew down the length of the runway with its rear cargo ramp open. Instead of an extraction parachute, however, attached to the load was a metal boom with a hook, which extended out the rear of the aircraft. An arresting cable was installed across the runway, and as the airplane flew over it, the load was yanked out of the airplane. Training on the GPES method was halted in the mid-1960's, because LAPES was thought to be the superior technology, and because GPES required special equipment and personnel on the ground in support of the operation. However, GPES was well suited to the scenario at Khe Sanh. Unlike LAPES, the load came to rest at an exact spot, thus speeding recovery and reducing potential damage to the runway surface. With GPES, moreover, there was virtually no chance of a runaway load; if the arresting cable was missed, the load simply would not extract. Furthermore, GPES utilized a standard modular platform, and all of the maintenance and repack difficulties inherent in parachute operations were non-existent. In early March, as the supply of LAPES equipment in theater dwindled, Army and Air Force logisticians suggested that GPES be resurrected and the necessary equipment was flown in from the United States. Navy Seabees installed the arresting cable approximately one thousand feet from the end of the runway. The Air Force

trained several aircrews on the system in Okinawa, prior to the first GPES in Vietnam on March 30. Fifteen loads were ultimately delivered at Khe Sanh in this manner, mostly construction material loads averaging ten tons each. However, that first GPES load reportedly included a crate of fresh eggs, of which only two were broken![66]

Rigging methods were not the only examples of aerial resupply innovation at Khe Sanh. The Air Force was responsible for developing and using the Ground Controlled Approach (GCA), Airborne Radar Approach (ARA), Adverse Weather Aerial Delivery System (AWADS), and the Ground Radar Aerial Delivery System (GRADS). These systems were navigational aids in poor visibility conditions and also helped improve airdrop accuracy.

AWADS was the major innovation from the Air Force's perspective, as it allowed them to drop supplies with no visual contact with the drop zone. Using ground-based radar to guide airdrop aircraft, combined with the airborne Doppler which provided the necessary offset capability, aircraft were able to drop in bad weather and, theoretically, at night. This method was called blind dropping, or Instrument Meteorological Conditions (IMC) dropping. This developed into the AWADS system that is still in use today. GRADS enabled dropping supplies from high-altitudes, using a method similar to what the French had employed at Dien Bien Phu. This particular capability was not needed at Khe Sanh, but would continue to be refined and was utilized at An Loc four years later.[67]

Airdrops ceased on 8 April 1968, and the runway was opened to C-130's the next day. Operation Pegasus, conducted by the 1st Cavalry Division, reopened Route 9 to Khe Sanh on 11 April 1968. The runway was eventually allowed to deteriorate, and was evacuated for good in early July. For 78 days, Khe Sanh had received emergency resupply by air. A total of 12,430 tons of materiel was delivered by the Air Force, of which 8,120 tons were airdropped. Airdrop totals included 601 CDS drops, 52 LAPES and 15 GPES deliveries. Drop accuracy was the best in history, owing much to ground radar and Doppler. C-130's relying upon visual conditions had an average circular error (ACE) of 95 yards. Utilizing the IMC (blind) technique, loads were within 133 yards of the intended target. The load recovery rate was extraordinary. All but three of the CDS bundles were recovered, and the damage rate

was ten percent for ammunition and five percent for rations. Mail was not forgotten, either. During the worst month of the operation, forty-three tons of it were delivered. Air Force records indicate that a total of 14,356 tons of cargo were delivered to the base, of which the Air Force only delivered the 12,430 tons indicated above. There are no records of the contributions of Marine Corps KC-130's, but the difference of 1,926 tons is probably the Marine contribution.[68]

Judging by the three essential criteria identified in Chapter 2, the aerial resupply of Khe Sanh was extremely successful. By any definition, airdrop operations were *responsive*, because they did get the right supplies to the force at the right time. Despite individual reports of ration, water and ammunition shortages, these were more a factor of inefficient apportionment of supplies that were already on the ground at Khe Sanh rather than a failure of the aerial resupply system. The consolidation of the airdrop effort under General Momyer was a positive influence on the entire operation. Every supporting element of airdrop operations remained completely *flexible*, from the aircrew who experimented with different radar configurations, to loadmasters and Army riggers who perfected LAPES and quickly resurrected GPES procedures when necessity demanded return to an older technique. Members of drop zone recovery parties had perhaps the most dangerous jobs at Khe Sanh, but they performed it amazingly well, allowing only three bundles to remain unrecovered. Marine ground controllers and Navy Seabees performed critical roles as well, not only guiding aircraft and repairing runways, but installing the critical GPES arrestor cable when it became needed. The airlift effort to Khe Sanh was truly a joint effort on a scale that was unprecedented at that time. Support was *continuous* and virtually uninterrupted. Operations at Khe Sanh ceased at a time of U.S. choosing, and the battle was a sound defeat for the North Vietnamese.

Only a few things might have improved the aerial resupply conditions at Khe Sanh, and Major General McLaughlin captured many of them in his analysis immediately after the battle. Some of his conclusions were almost clairvoyant, as they predicted emerging technology and doctrinal shifts in several widely varying fields. He correctly anticipated the impact that AWADS would have on the ability to eventually conduct airdrops in all types of weather and at night. McLaughlin also saw the need for

tactical aircraft to be constructed with tires and fuel tanks that are immune to shrapnel and small-arms fire. This technology is now available, not only on aircraft, but on the all-terrain recovery vehicles and forklifts for which he also saw the need in 1968. He felt very strongly that Khe Sanh justified the need for continued exploration of alternate airdrop means, to include low-level (such as LAPES and GPES), high-altitude, and even radio-controlled parachutes that could be remotely guided to a precise impact point. (Thirty years later, we are just introducing this last item into the armed forces.) Varied means of delivery, he believed, gave the commander more options. Furthermore, McLaughlin felt that "...we must exert efforts to improve aerial delivery modes—developing cheaper parachutes, a higher degree of accuracy, greater capability and flexibility—instead of eliminating or discounting airdrop because of expense." These improvements have come to pass, in one form or another.[69]

McLaughlin recognized, as did Colonel (Retired) Ray Bowers, author of *The United States Air Force in Southeast Asia: Tactical Airlift*, that when situations like Khe Sanh arise, they are normally unexpected. Even though we may feel that we have the latest technological edge, we must still rely on the individual soldier, airman or marine to adapt to the changing situation. At Khe Sanh, this was the case:

> "Ultimately, the success of the Khe Sanh resupply was a product of ingenuity...examples of improvisation and resourcefulness among air and ground crewmen were every day commonplaces. That room for imaginativeness remained and that individuals were encouraged in its use spoke well for the American military system."[70]

Chapter 5 – An Loc: A True Siege

"The enemy enjoys observing no resupply...Come hell or high water, supplies have to get through!" Colonel William Miller, Division Senior Advisor, An Loc, 1972.[71]

The circumstances that initiated the need for aerial resupply at An Loc in 1972 were profoundly different than those at Dien Bien Phu or Khe Sanh. At both of those previous engagements, the allied forces had made conscious decisions to wage fights that ultimately would be supportable only by airdrop. For the French, this was because Dien Bien Phu was always beyond the range of ground transportation. They felt that their Algerian and previous Vietnamese experiences had sufficiently proven that they could support forces indefinitely with supply from the sky, but they were eventually proven wrong. At Khe Sanh in 1968, General Westmoreland had enormous confidence, not only in his tactical airlift and airdrop support, but also in the ability of his artillery and bombers to adequately suppress enemy anti-aircraft artillery (AAA). He engaged the North Vietnamese at the place and time of his choosing, and he successfully concluded the battle under similar conditions. The battle for An Loc has since become a classic study in the application of tactical airpower, to include airlift. Despite significant setbacks in the initial attempts to resupply the besieged forces at An Loc, ingenuity and perseverance enabled the airdrop system to be, at last, successful. Although the "siege" lasted for only 66 days, the requirement to airdrop supplies to ARVN forces in An Loc and to those forces attempting to relieve the city from the south would last for over four months.[72]

Conditions in Vietnam in 1972 were radically different than they were during the height of U.S. involvement in 1968. Most Americans thought the war was over by 1972. As part of President Nixon's promise to end the war, very few U.S. combat troops remained in Vietnam, and most of those were acting in an advisory role with South Vietnamese forces. This was part of what Defense Secretary Melvin Laird entitled "Vietnamization." Westmoreland had left in 1968, and General Creighton W. Abrams had succeeded him as Commander, MACV. On 30 March 1972 the NVA, still led by General Giap, began its Spring, or Easter Offensive, also known as "the Nguyen Hue Campaign" to the North Vietnamese.

Giap's overall objectives were to destroy as much of the ARVN as possible, but to also occupy key cities in the south, thus placing additional pressure upon President Thieu and the South Vietnamese government. The offensive was conducted with a largely conventional force of about 120,000 men, supported by massive amounts of Russian T-34 and T-52 tanks, 130mm artillery pieces, and surface-to-air missiles. The offensive called for three near-simultaneous attacks. The northernmost was against the cities of Quang Tri and Hue. In the central region, the NVA intended to divide South Vietnam along a Kontum-Hoai Nhon axis. Finally, in the south, three divisions advanced toward Saigon from bases in Cambodia. The southern effort, in what was termed by the U.S. as Military Region III (MRIII), was initially expected to come from Cambodia into Tay Ninh province. Furthermore, fighting of the ferocity experienced in MR I in the north was not anticipated by MACV. It was soon apparent that the probes into Tay Ninh were merely feints and that the main effort in the south would come down Highway 13 toward An Loc.[73]

In Military Region III, which encompassed Saigon, was the province of Binh Long, whose capital was An Loc. Only 65 miles north of Saigon, An Loc was a thriving city of about 15,000 in the midst of some of Vietnam's largest and highest quality rubber plantations. Because of its location along Highway 13, An Loc had long been of strategic importance to the North Vietnamese. Since U.S. intelligence did not predict a major offensive in MR III, the 5th ARVN Division was the only division defending in this sector, and they were spread throughout Binh Long province. The diversionary attacks in Tay Ninh effectively masked the movements of the three North Vietnamese Divisions from bases in Cambodia into South Vietnam: the 5th and 9th VC Divisions, and the 7th NVA Division. Although two of these divisions still carried their VC designations, they were largely NVA regulars who were well trained and equipped, and had been moved into position via the Ho Chi Minh Trail. Beginning on 5 April, the NVA began to attack into Binh Long Province, and An Loc began to receive indirect fire. If An Loc fell, Saigon would be within the grasp of these large conventional NVA forces.[74]

Loc Ninh was a smaller town approximately fifteen miles north of An Loc, and was the northernmost municipality in the province. It was first to fall in the NVA push southward, and less than a

hundred of the defenders of that town escaped south to An Loc. The intensity of the attack on Loc Ninh convinced Major General James F. Hollingsworth, commander of Third Regional Assistance Command (TRAC), that the offensive into Binh Long province was no diversion. He notified the 5th Division commander that ARVN forces at An Loc must be prepared to hold the city. As the situation continued to unfold, thousands of civilians attempted to flee southward toward Saigon, as they knew a climactic battle was about to unfold. President Thieu, aware that the fall of An Loc would open the door to Saigon, ordered his commanders to defend the city to the death. Simultaneously, the soldiers of the NVA were prepared to die in the attempt to sieze it. A captured ARVN officer later reported that his NVA captors told him "...they were going to take An Loc at any cost."[75]

The actual battle for An Loc began on 13 April 1972. By that time, the NVA had captured the airstrip at Quan Loi, and blocked Highway 13 to the south. The surrounded city began to take an unimaginable battering by NVA tanks and artillery. Only extraordinary efforts on the part of ARVN soldiers and their advisors, supported by U.S. air power and aerial resupply, enabled the defenders to withstand the onslaught. That the South Vietnamese soldiers were able to establish any semblance of a defensive perimeter in the first place is quite an achievement. This success was due to several factors. Foremost was the fact that they were completely surrounded; there was no choice but to fight. Secondly, once the first NVA tank was destroyed by a shoulder-fired anti-tank weapon, morale improved considerably, as the ARVN soldiers finally believed their American advisors: the tanks *were* stoppable. Moreover, the NVA was *not* well trained in combined arms warfare, and seemed incapable of effectively coordinating armor movements with artillery barrages and their human-wave infantry tactics. Finally, the effects of massive B-52 strikes and U.S. tactical air support had a devastating impact on NVA units. These factors allowed the situation to stabilize into the siege that would last for the next three months, as both sides struggled mightily for control of the city.[76]

Under these conditions, resupply would have to be conducted by air. Senior advisors needed to keep morale as high as possible if their defense were to be successful, and regular, effective resupply operations were instrumental in sustaining that morale. The NVA, conversely, was counting on the

erosion of ARVN morale as part of their strategy. The commodities most in demand were food, ammunition and medicine.[77] Initial attempts at resupply by helicopter were not very successful, and a South Vietnamese CH-47 was shot down by anti-aircraft fire on 12 April. The effectiveness of NVA anti-aircraft fire was impressive, and combined with a system of spotters it produced a defensive ring around the city that was nearly impenetrable. During the second week of April, VNAF and U.S. CH-47's, along with VNAF C-123's and UH-1B helicopters, were able to deliver around three hundred tons of supplies. However, by 12 April, helicopter resupply attempts had halted, largely because many VNAF pilots refused to fly missions into the city, and those that did were being shot down. C-123 drops continued until, on the 18 April, the fortieth sortie was hit and crashed south of the city. The decision was made to begin airdrops using only USAF C-130's and An Loc's soccer field, located in the southern part of the city, was selected as the primary drop zone.[78]

The supply request system, in contrast to the actual delivery, was reasonably effective. The senior logistics officer at 5th Division Headquarters gathered the requirements. They were then passed to the III Corps logistics section at Lai Khe, and finally to the Central Logistics Command in Saigon. The cargo was then trucked from ARVN depot stocks to Tan Son Nhut air base, where it was rigged and loaded into aircraft. Simultaneously, the cargo manifests were radioed back to An Loc. It normally took three days from request to aerial delivery of supplies, although one-day responsiveness was attained by mid-May.[79]

The first five airdrop missions executed by the Seventh Air Force's C-130's were standard, daylight, low-altitude Container Delivery System (CDS) drops. This method had been very effective for the USAF in Vietnam. The normal "modus operandi" prior to An Loc involved flying to the objective drop zone at high speeds and low altitudes, then "popping up" to the drop altitude (normally 700 feet) to execute the drop, and finally dropping back down to low altitudes for the exfiltration. However, for this type of operation to be successful, surprise was required, and anti-aircraft fire needed to be suppressed. These conditions never developed at An Loc in April of 1972. The first drops contained ammunition, food and medical supplies, and while they were relatively accurate airdrops into the 200 x 200-meter drop

zone, the aircraft all received substantial damage from NVA flak. The last of the first five sorties was shot down west of An Loc on 18 April, and this resulted in the cancellation of daylight, low-level CDS airdrops. The crew, incredibly, survived the crash and was immediately rescued by Army helicopters.[80]

The next aerial deliveries were made using the Ground Radar Aerial Delivery System (GRADS), which the Air Force had been developing for nearly a decade. The GRADS method involved flying at an altitude between 6,000 and 9,000 feet, which placed the aircraft out of range of the enemy AAA. Then, after arriving at a Computed Aerial Release Point (CARP), the bundles were airdropped, each equipped with a delayed-opening device on the parachute. Using a timing mechanism, the parachutes would deploy at around 500-800 feet above the ground, which, in theory, was sufficient time to allow the canopy to fully inflate and slow the CDS bundle before impact. The crews of the 374th Tactical Airlift Wing were familiar with the procedure, and some had even trained on it in the U.S.

The reality at An Loc, though, was quite different. Inaccurate drop coordinates provided to some of the crews combined with parachute malfunctions caused most of the GRADS bundles to be either destroyed because their parachutes failed to open, or worse, to drift outside the defended drop zone perimeter and into enemy hands because parachutes opened early. The situation became so desperate that an American advisor commented that what bundles did make it into the city went to the "...strongest, swiftest, and closest to the pallet drop." One captured NVA officer even asked his captors for C-ration fruit cocktail, as he had been subsisting on cases recovered from an errant drop and had developed a taste for it.[81]

The effect on the ARVN troops and their American advisors was deleterious and predictable. Not only were they being insufficiently resupplied, but their enemy was enjoying rations meant for them. Friendly units began to fight to recover loads that did manage to fall within their perimeter, and supplies were sometimes hoarded. Soldiers of the 5th Division fired upon ARVN rangers on several occasions, and an American officer carrying C-rations was even challenged by ARVN troops at gunpoint. Colonel William Miller, 5th Division's senior U.S. advisor, was openly critical of the ARVN's inability to organize the supply recovery efforts. He later reported seeing hospital patients, some of whom were

amputees, struggling to recover food for themselves. They often received additional wounds in the attempt.[82]

Eventually, Colonel Le Quang, commander of the 1st Airborne Brigade which had entered An Loc on 22 April, was placed in charge of load recovery and distribution. The situation dramatically improved. Colonel Quang also ensured that the meager supplies were shared with the remaining civilians in the area. Initially the NVA had allowed civilians to flee the city to the south as they tightened their noose around it. However, they soon realized that by keeping civilians in the city, they intensified the supply situation for the ARVN, and so they cut off all escape routes. In addition to the 4,000 men of the 5th Division, approximately 6,000 civilians soon looked to the skies for subsistence. They helped their own situation by bringing whatever fresh vegetables and meat they could scavenge from their homes and gardens, and they also assisted in attending to the wounded. Some even did laundry for the troops. Cooperation between the local population and the ARVN reached its zenith at An Loc.[83]

The GRADS technique was similar in design and function to what the American and French riggers had attempted in 1954 at Dien Bien Phu. However, there is no evidence that anyone in the U.S. Army, the USAF or the VNAF benefited from this experience when it became necessary to execute it over An Loc. The malfunctions of the first high-altitude drops attempted at An Loc were directly traceable to the ARVN riggers. They did not have any experience in the packing procedures required to allow a canopy to open at a prescribed lower altitude, nor did they have the technical background to become proficient at it. As a result, a decision was made on 23 April to return to the low-level technique. Daylight, low-level airdrops continued for the next three days, and again accuracy improved but the price was high. Every C-130 received some sort of damage from anti-aircraft fire. The methods developed by USAF loadmasters to protect themselves from the intense fire are especially telling. Unlike the cockpit of the C-130, the cargo compartment was unarmored.

> " '...He (the loadmaster) gets his armored flak vest on, takes a flak vest apart and puts it over his legs, lays tie-down chains on the cargo compartment floor, puts the garbage can on the chains, gets in and from that position activates the static line retriever for the drop.'"[84]

On 26 April, another plane was shot down, this time killing the crew. Again, daylight drops were abandoned, this time in favor of low-level attempts at night.[85]

Although the night operations were less risky for the flight crews, the accuracy of the CDS drops was abysmal. On the night of 27 April, the VNAF attempted one last high-altitude airdrop mission with a total of eight C-123's. Only one of the eight ships was able to hit the target at all, and out of 116 total CDS bundles, only six were recovered by friendly forces. The night missions of the USAF were not faring much better, even though they were restricted to low-level operations. General Hollingsworth reported that during the last half of April, less than thirty percent of the total tonnage dropped had been recovered by the ARVN. The small drop zone was partially to blame. (The 200-meter length was less than half of the standard 550 yards recommended by USAF manuals and utilized in normal training and operations.) Moreover, the aircrews needed a visual identification of the drop zone, and were accustomed to standard lighting procedures: lights placed at timing points, on the leading and trailing edges of the drop zone, and also at the point of impact (PI). The ARVN forces controlling the drop zone used makeshift gasoline flare pots, and were unable to place them in standard locations because of enemy fire. As a result, aircrews were often unable to distinguish these flares from the hundreds of other fires burning in the city. Attempts to illuminate the drop zone with aerial flares had the deleterious effect of silhouetting the aircraft, thus making them even easier prey for AAA. Darkness further added to the difficulty encountered by troops attempting to recover the loads.[86]

The night drops, nonetheless, continued, although Colonel Miller deemed the results completely unacceptable, stating that "...there was no explanation but 'gross neglect on someone's part in the Air Force.' "[87] For the week preceding the night of 3 May, American advisors estimated that over 350 tons of supplies had dropped into enemy hands. They further calculated that friendly forces had received no more than eight percent of the total supplies airdropped since the beginning of the siege. Another advisor, similarly frustrated, said, "...One of the real puzzling aspects of the entire operation is why it took the Air Force approximately 26 days to get with the program...."[88] Moreover, the enemy's ability to target aircraft over the drop zone was getting better. On the night of 3 May, another C-130 was shot down

(bringing the total to three), and the crew perished. The remainder of the drops scheduled for that night were cancelled, and Seventh Air Force permanently aborted low-level airdrops the next day. Although the bravery and professionalism of the aircrews was never in question, frustration on the ground at An Loc, and back at Tan Son Nhut Air Base in Saigon, was at an all-time high.[89]

Prior to the 3 May crash, the Air Force had begun looking for alternative methods to deliver supplies from the air, and alerted MACV that additional resources were needed. In response to MACV's request for assistance, the Army sent seventy-six riggers from the 549th Quartermaster Company (Aerial Resupply) who were located in Okinawa, Japan, to Vietnam on 24 April. Additionally, the Air Force sent its airdrop experts from the Ching Chuan Kang (CCK) aerial port at Taiwan. The 549th had a long legacy of supporting airdrops. Originally the 2348th Quartermaster Detachment (Airborne Air Supply & Packaging) during World War II, they were redesignated the 8081st QM Company (Air Supply) in Korea. Ironically, it was also the 8081st that had deployed to Hanoi in 1954 to assist the French in the original high-altitude airdrops over Dien Bien Phu. Eighteen years later, the 549th riggers colocated themselves with the Vietnamese riggers already at Tan Son Nhut. They immediately set to work on improving the rigging line, which was located adjacent to a small aircraft loading area on the eastern side of the main airstrip. The Vietnamese and U.S. Army riggers worked twenty-hour shifts, side by side, in exposed conditions.[90]

The quality of aerial resupply improved immediately. The combined efforts of both nations resulted in an improved high altitude dropping method that was remarkably similar to the high altitude airdrop attempts made by the French in 1954. Similarly, the system was designed to only allow the parachute to partially inflate upon leaving the aircraft. This time, however, heavier reefing lines were applied, along with pyrotechnic cutters with a fifty-second delay. This allowed drop altitudes of nearly 10,000 feet. As in Dien Bien Phu, the cutters activated as the load neared the ground, allowing the parachute to inflate to its full dimension, and sufficiently slowing the speed of the CDS bundle to prevent load damage. The system was tested several times at Tan Son Nhut with reasonable success. This new method, along with the increase in rigger support, prompted the decision to resume airdrops on 4 May.[91]

The ground commanders noticed an immediate improvement. Of the sixteen CDS bundles dropped on the fourth, only one bundle landed outside the DZ perimeter. However, there were still problems. Some of the parachutes failed to open completely (i.e. the cutters failed to activate properly), and some cargo was partially destroyed. The next day, eleven C-130's conducted airdrop missions. Seventy-three out of eighty bundles landed within the perimeter, but again, more than half of the parachutes failed to fully open before impact. Even though some of the cargo was damaged, friendly forces were still recovering it, and the improvement in morale was noticeable to the American advisors. The riggers continued to explore the problem with parachutes that failed to open properly. On 7 May, they discovered that some of the reefing lines were shorter than the prescribed length, thus not allowing sufficient air into the canopy during its reefed, or free-fall, descent. This would effect the performance of the canopy when the cutter activated. After correcting this deficiency, they began to place a second cutter on the reefing line, to increase the chances of a proper cut. As a final measure, they began inserting a twenty-foot sling between the CDS bundle and the parachute. This allowed the canopy to remain out of the slipstream caused by the load itself during free fall. The effects of these improvements were witnessed immediately. By 10 May, only five percent of parachute canopies were malfunctioning, and this rate remained constant thereafter.[92]

A new concern soon developed, though. The available stock of fifty-second cutters was nearly exhausted, and the thirty-second cutters proposed as a substitute would require aircraft to fly at a considerably lower, and therefore more dangerous, altitude. The manufacturer was contacted, but could not provide new mechanisms in less than thirty days. Compounding the problem was a report that the NVA had acquired SA-7's, which would make low-level airdrops suicidal. Again, however, Army riggers and their Air Force counterparts rose to the challenge and developed an entirely new method of aerial delivery: high-velocity airdrop. Instead of using a normal G-12 parachute, the riggers attached a fifteen-foot diameter parachute that was slotted to allow air to flow freely through it during descent. This "ringslot" parachute had previously been used for LAPES missions, but the airdrop experts recognized the potential for a high-altitude, high-velocity application. In this new system, the parachute was

primarily acting as a stabilizing factor on the CDS container, and it only slowed the bundle to a rate of descent of approximately 128 feet per second (four times normal impact velocity under a G-12 parachute). This would obviously require the riggers to use multiple layers of cardboard energy dissipating material, or "honeycomb," to prevent damage to the cargo, but the advantages of the method far outweighed this additional consumption.[93]

The first advantage to the high-velocity method was that there was no low-opening phase required for the parachute and therefore no need for a delayed-activating cutter. More importantly, the new system was far more accurate than any of the previous HALO methods, primarily because of the high-speed descent. Sixteen bundles airdropped by a single C-130 using this method had a more limited dispersion pattern, and normally fell within a 100x150-meter area. Test drops were conducted and the riggers discovered what types of cargo could and could not survive the high-speed impact.

> "For example, rice in boxes, fuel in barrels 2/3 to 3/4 full, and M-16 ammunition landed intact. However, fuel drums flattened, bags of rice split and, when a chute holding 105mm ammunition malfunctioned, primary and sympathetic detonations lasted for hours."[94]

The danger was not only to the cargo, however. A one-ton package falling at 128 feet per second could (and did) do considerable damage. One such instance was when a thousand pounds of peaches landed on a parked jeep, totally crushing it. Most frequent, though, were airdrops of rice and small-arms ammunition, which were packaged robustly enough to survive the impact.[95]

From 8 to 10 May, over sixty-nine tons of supplies were delivered using the High-Velocity Airdrop (or High-V) method. Only one CDS bundle landed outside of the perimeter of the DZ, and there were no parachute malfunctions. Riggers would attach a single fifteen-foot ringslot parachute for a one thousand pound load, two if the cargo weighed up to a ton. Towards the end of siege, riggers experimented with twenty-two foot ringslot parachutes, and they found that they delivered even more accurate ballistic results. The drop zone, concurrently, had been expanded to over 1,640 square yards, and greater than 95 percent of all supplies were landing within its boundaries. The modified HALO method was used in conjunction with High-V airdrop until stocks of the cutter devices were exhausted in

mid-May. Additionally, the USAF began drops to the forces attempting to relieve An Loc from the south, moving up Highway 13.

Airdrop accuracy continued to improve as a result of even more improvements and modifications to different elements of the system. In early June, CCK in Taiwan received the first C-130 "E-models," which were all equipped with the refined Adverse Weather Aerial Delivery System (AWADS). AWADS had been in the experimental stages during Khe Sanh, but was now perfected. The first AWADS drops took place on 20 June, but GRADS still was the preferred technique. Concurrently, Army analysts at research facilities in the United States had developed yet another airdrop alternative. This high-altitude, low-opening (HALO) method employed standard G-12 parachutes with F-1B cutters, which were activated by changes in barometric pressure. This was the same technology used in automatic-opening devices used in high-altitude personnel parachuting. Riggers from the 549th first tested the system near Saigon in early June, and the first drops over An Loc occurred on 18 June. The new system allowed the logisticians to conserve the rapidly declining stocks of High-V rigging items, and it also provided a safer method of delivering sensitive items such as medical supplies and certain munitions. Furthermore, it allowed drops from above 10,000 feet, though it was not quite as accurate as other airdrop methods.[96]

On 18 June, ARVN commanders declared the siege over. However, airdrops continued at a reduced rate for several more months because Highway 13 was still blocked. The riggers from the 549th returned to Okinawa on 15 July, leaving six advisor/inspectors behind to continue to assist the Vietnamese. By this time, the USAF was averaging two airdrop sorties per day. Normally, one utilized the F-1B HALO method, while the other was High-V. When the sixty-second cutters began to arrive from the manufacturer in August, the F-1B method was eliminated altogether. Stocks of High-V rigging items (particularly ringslot parachutes) were exhausted in August as well. MACV logisticians were becoming increasingly concerned with the cost of the operation. Each sortie carried over $12,000 in rigging items alone, and only ten percent of the equipment was being recovered and returned. ARVN soldiers and civilians alike were recycling parachute material and slings for other purposes. Much of what was returned was too badly damaged to be economically repairable. General Hollingsworth

suggested a temporary halt to the airdrops in July, because he felt that the airdrops had become so effective that the ARVN lacked the incentive to reopen Highway 13 into An Loc. However, he was overruled, and the USAF continued limited airdrops through the end of the year.[97]

American air power, to include aerial resupply, was critical to the success of the ARVN at An Loc in 1972. Although North Vietnam was gradually winning the war, there were efforts of heroic proportions exhibited by South Vietnamese soldiers and their American advisors during the Easter Offensive. Colonel Miller, however, would later report to Congress that, in his opinion, the ARVN had not really won at An Loc, but had merely avoided defeat.[98] Army and Air Force logisticians, although stymied at the beginning of the operation, eventually exhibited tremendous ingenuity and flexibility. They repeatedly adapted to changing conditions on the ground, and they relatively quickly perfected and implemented new technology and procedures. Army riggers were able to immediately identify shortcomings in Vietnamese rigging procedures and quality control, and their efforts contributed greatly to the responsiveness of the logistical effort.

Among the key lessons-learned at An Loc was the need for a reliable high-altitude airdrop system, one that would enable the aircraft to remain above the range of surface-to-air missiles. The airdrop experts from the Army and Air Force were able to obtain new technologies from the United States, and to perform a rapid series of tests and training drops. They were then able to capitalize on these new systems and get the supplies to the beleaguered troops. Another significant lesson was that "...careful and correct rigging through prolonged training and supervision of rigger personnel was essential."[99] The battle for An Loc fits the definition of a classic siege and, like Khe Sanh, demonstrated the talent and capability of the U.S. logistical system. However, possibly because there were relatively few Americans left in Vietnam in 1972, the battle remains historically obscure, and the U.S. military did not adequately capture the dynamic aerial resupply experience gained there. The next chapter will examine where the U.S. Army stands in terms of airdrop developments today. Some of these developments directly reflect the positive and negative airdrop experiences spanning two decades of western involvement in Vietnam.

Chapter 6 – Airdrop Today

"The United States will conduct humanitarian airdrops over Bosnia...to supplement the land convoys. This is a temporary measure designed to address the immediate needs of isolated areas than cannot be reached at this time by ground." President Clinton, 1993.[100]

The U.S. Army, as an institution, has failed to fully capitalize upon the lessons learned about aerial resupply during the Vietnam Era, but the developers have not been completely delinquent in their pursuit of airdrop modernization. Aerial resupply remains a viable logistical option for today's armed forces, both for initial insertion of forces and their equipment and for emergency resupply missions. Furthermore, peace operations have placed an entirely new set of requirements upon the Department of Defense, and upon logisticians in particular. Airdrop is a means to accomplish some of these unusual objectives. Like any weapons system or combat capability, though, airdrop methods and doctrine must be refined and updated in order to maintain pace with new requirements from ground commanders and new airlift technology. Chapter Two outlined how the U.S. armed forces have attempted to update their doctrine to keep pace with the changing security environment. The task of bringing fresh technology and methods to the airdrop community is the responsibility of combat developers and the military's research laboratories.

For nearly two decades after U.S. involvement in Vietnam ended, the impact of technology upon airdrop techniques and systems was not overly dramatic. In fact, the U.S., like most of the world's militaries, are still using the same basic cargo parachute designs that were developed in World War II. There have been minor improvements to these designs, however, and developments in platform technology have been slightly more dynamic. In the 1990's, though, the logistics community has seen the advent of radically new airdrop systems and design changes, some of which have been adopted, others of which await further consideration. Some of these developments are not really new, but because logistical records from the Vietnam experience are so incomplete, they are just now being rediscovered. However,

one aspect of the developmental process has remained consistent over time: change has resulted from a desire to improve upon older systems and to invent new ones.

Airdrop has never been an efficient method of delivering supplies, so combat developers have constantly endeavored to increase the limited capacity and minimal accuracy of existing systems. Most of the current military airdrop systems are also labor intensive, requiring highly specialized personnel for rigging of the parachutes and cargo. Furthermore, successful airdrop operations have historically required a permissive air environment, i.e. air superiority. Concern for the safety of airplanes and aircrews has been the top priority of the Air Force, usually taking precedence over the need for resupply on the ground. Therefore, airdrop researchers have hunted for systems that exploit the benefits of modern technology to provide accurate autonomous guidance and an increased load capacity. Moreover, any new capability under consideration should strive to be successful in a non-permissive environment, and ideally would be safer, less labor intensive and less costly than existing systems.[101]

Several developments and programs initiated in the last several years meet the above criteria. They include the 60,000 lb. capacity airdrop system, dual-row airdrop, the Enhanced Container Delivery System (ECDS), the 500-foot Airdrop System, the Advanced Precision Aerial Delivery System (APADS), and the Low Cost Aerial Delivery System (LCADS). Many of these systems are designed to work in conjunction with one another, and most are driven in some measure by attempts to maximize the capabilities of the new Air Force lift asset, the C-17 Globemaster. The last four programs warrant further description because they appear to have roots in Vietnam airdrop history, and they will have a significant impact on the future of emergency supply operations.[102]

The Enhanced Container Delivery System is a notable improvement to the CDS system that had effectively served the armed forces relatively unchanged since World War II. Instead of a having a base platform consisting of a 48x48-inch plywood square, the ECDS utilizes the standard Air Force 463L aluminum cargo pallet. The 463L pallet was first introduced in the late 1960's, but it was not considered as an airdrop platform until recently. It provides the system with several advantages over the smaller, plywood method. In addition to being easier to rig and prepare, the ECDS, because of the 463L, is also

easier to transport, forklift, and load onto the Air Force cargo handling equipment. Additionally, the pallet dramatically increases the delivery capacity of the system, and initial tests indicate that it will be more accurate from varying altitudes than standard CDS. Standard bundles can be loaded with a maximum of 2,200 pounds, but the ECDS will eventually be capable of 10,000 pounds of cargo. Although the enhanced system will cost more than regular CDS, the increased capacity and the fact that the 463L pallets serve a multitude of other logistical and transport purposes make this improvement quite efficacious.

The 500-foot airdrop system is another remarkable development, primarily benefiting the Air Force. This type of delivery utilizes the Type V platform, and it is for heavy cargo and equipment loads. The requirement was driven by a need to ensure the aerial delivery of critical items such as the HUMMWV, or the howitzer and ammunition package for light forces. As its name suggests, this improvement will allow these critical items, up to 22,000 pounds, to be airdropped from 500 feet, instead of from the standard 1,200 to 1,500 feet. This increases aircraft survivability as well as improving accuracy because of the lower altitude. Moreover, this low altitude cargo airdrop program complements ongoing efforts of the Infantry School to develop a 500-foot personnel delivery capability. This development would have been of enormous benefit to the Air Force in Vietnam, particularly at An Loc, where AAA was intense.

The Advanced Precision Aerial Delivery System is perhaps the most "high-tech" development of the 1990's, although it is merely an improvement on an old idea. The French at Dien Bien Phu and the Americans at An Loc had both attempted to perfect a method of dropping CDS bundles from high altitude. The French were not successful, and the U.S. only partially so, as described in earlier chapters. The APADS family of container delivery systems takes computer and satellite technology and applies it to the decades-old notion of the Container Delivery System (CDS). Using a Global Positioning System (GPS) receiver for guidance, APADS can deliver payloads to within one hundred meters of the designated coordinates. Because it uses a parafoil similar to a high-altitude, free-fall personnel parachute, it allows the aircraft to be offset a considerable distance from the target area, thus providing for increased aircraft

safety and mission security. The maximum cargo load currently available is 42,000 pounds, although the Army has only purchased the smaller version, with similar characteristics to the one ton standard CDS. The United States Marine Corps and several of our allied nations have expressed significant interest in this program, however.

The Low Cost Aerial Delivery System (LCADS) is an innovation that will dramatically decrease the expense incurred by the U.S. during the next large-scale requirement for humanitarian airdrop such as occurred in Bosnia in 1993-4, or in any tactical airdrop scenario where the return of airdrop equipment is not expected or improbable. LCADS will reduce the operational cost of these types of missions through the use of prepackaged, one-time use parachutes. The system has the same one ton capacity as standard CDS, but at about half the cost. At the time of this writing, over a thousand have been purchased by the Army and placed in operational project stocks, although if Bosnia is any indication of the tempo of future operations, this amount will be woefully inadequate.[103]

The situation at An Loc demonstrated just how expensive air items can be, but in the twenty-one years that have transpired between the Easter Offensive and the mandate by President Clinton to commence airdrops into the former Yugoslavia, very few resources have been committed to developing a system like LCADS. To the Army's credit, it did not take long to develop LCADS and make it available to the force after the need was officially recognized. However, this came after nearly $30 million worth of airdrop equipment had been expended, none of which was returned from Bosnia. Additionally, this resulted in the absolute depletion of certain items from U.S. war reserve stocks, to include 22 and 26-foot ringslot parachutes. As a result of this equipment shortage, engineers from Natick Research Laboratories and the riggers of the 5th Quartermaster Detachment (Airdrop Support) demonstrated the same ingenuity and flexibility displayed by their predecessors in Vietnam.[104]

For Operation Provide Promise, as the Bosnia mission was officially titled, the riggers and the civilian experts from Natick developed a method of reefing a standard G-12 parachute so that it would perform with the same high-altitude characteristics as the 26-foot ringslot canopy. They also perfected procedures to drop double-CDS bundles in this fashion, and tests were even conducted on a Quad-CDS

configuration (four standard CDS bundles on one platform) in Germany during the mission. The results were positive, although actual drops of this system were not carried out in Bosnia. Another innovation to come out of Provide Promise was the Triwall Aerial Delivery System (TRIAD), which was devised by 5th Quartermaster Detachment riggers and Air Force loadmasters. The system provided the U.S. with a method of free-dropping Meals, Ready to Eat (MREs) without the high cost of parachutes and other air items. The total cost for each TRIAD was only eighty dollars, versus the nearly one thousand dollar price tag for a standard CDS bundle. When ringslot parachute stocks were exhausted, and modified G-12 canopies were used, the cost per bundle nearly tripled.[105]

The ability of the airdrop community to function "jointly and multinationally" was reconfirmed during Operation Provide Promise. Just as had occurred at Dien Bien Phu, Khe Sanh, and An Loc, U.S. Army riggers were thoroughly integrated with U.S. Air Force aircrews, loadmasters and ground crews, as well as with their international partners. Riggers and ground support personnel from France and Germany were attached to the joint rigging team at Rhein-Main Air Force Base. Additionally, a multitude of United Nation's and non-governmental organization representatives were collocated with the rigging team to facilitate the procurement and stockage of the food, medicine, clothing, toys, and construction materials that were donated from around the world.

Not all of the recent developments in the airdrop arena have been positive, however. In 1992, an initiative was generated to dispense with the LAPES aerial delivery capability. The Quartermaster General at that time believed that maintaining the equipment and training proficiency on a system that had not been used for a real world contingency since Khe Sanh was not justifiable. The XVIIIth Airborne Corps agreed with him, as did the Air Force, since they were having difficulty maintaining currency with LAPES aircrews and there had been several aircraft accidents related to LAPES missions. However, one of the most significant lessons to come out of Khe Sanh was that proven systems should not be scrapped if they can be retained for a minimal cost. The U.S. quickly resurrected the GPES system when it began to run out of the newer LAPES equipment items in 1968, and a similar situation could occur in the future with LAPES itself. Major General Robert Guest, the subsequent Quartermaster General, was able to

demonstrate that maintaining a minimal LAPES capability would not be overly expensive, but he was unable to garner any support among the current Army leadership. A final memorandum was sent to all the combatant commanders in 1995, to determine the continued need for LAPES, but since the system was not planned for use in any existing contingency plans, LAPES officially died in 1995.[106]

Another example of the Army's being too focused on the present concerns the future of APADS. The XVIIIth Airborne Corps witnessed a demonstration of the capabilities of APADS during its development in the mid-1990's. However, because the system utilizes computers, GPS and other items with electronic "signatures," it was believed to be at significant risk of being shot down by modern surface-to-air missiles. In addition, the high-cost/low-payload relative to standard low-velocity airdrop and the highly specialized requirements for rigging and preparation, prompted the command to conclude that it did not want to pursue procurement of this system. As a result, APADS, for the moment, will remain a tool solely of the special operations community and the U.S. Marine Corps, and further research and development of APADS may be in jeopardy. The XVIIIth Airborne Corps argument has some merit, but the crux of the matter is this: technologies like the APADS family of airdrop systems represent the future of airdrop, and without the support of our largest airborne force, the Army will not adequately fund further development.

Ironically, the on-going Advanced Warfighting Experiments being conducted at Fort Hood embrace just these types of combat developments. Our light force leaders need to recognize that by endorsing emerging technology today will mean that tomorrow's airdrop systems can meet their every demand: precision, low-cost, and simplicity. Next year the Army will begin to digitize its first light units, and the lack of a high-tech airdrop capability may be identified as a glaring shortcoming. Of course, the developers will be able to resurrect systems like LAPES and APADS if future need arises, but at what cost? The expenditure will not only be in development dollars, either. In today's security environment, the delays caused by having to "reinvent the wheel" will perhaps be measured by lost security objectives and even the lives of soldiers and civilians. This is the most significant lesson-*not*-learned from Vietnam.

Chapter 7 – Conclusion

"If pursued with caution and intelligence, efforts to apply history are entirely legitimate.... Discovering useful lessons from history requires that we examine the past through a lens made up in part of present-day concerns." A.J. Bacevich, The Pentomic Era[107]

In today's constantly changing security environment, the U.S. military is repeatedly expected to respond to unpredictable conditions. The multilateral interests of the United Nations' member states and other international actors increasingly influence the United States' foreign policy decisions, and this has serious repercussions for the application of military force. The end of the Cold War has mandated that our armed forces can no longer structure and prepare themselves to meet only a single type of threat in a predictable, West European scenario. Peacekeeping, peace enforcement, disaster relief and humanitarian assistance are only a few examples of the responses that governments worldwide are asking their military forces to conduct. In the U.S., furthermore, these missions are considered secondary to our warfighting focus, which demands decisiveness and precision while espousing total force protection. Our doctrine and methodology, therefore, must be flexible enough to allow our defense force to respond to any mission that is asked of it, and to do so in a confident and decisive manner.

However, many of the so-called "peace operations" listed in the above paragraph do not involve the use of combat forces, but instead focus on engineers, transportation and other logistical assets such as water purification elements. Logistics is a major element in post-Cold War military force applications, and aerial resupply has a place in this new security environment. The U.S. has both a need and an obligation to maintain a potent combat capability to defend its own security interests and those of its allies. Recent combat actions such as Grenada and Panama show that large-scale airborne operations are still possible, and the maintenance in U.S. Army force structure of a conventional airborne combat capability is still necessary. (However, the requirement to maintain the capability to airdrop a brigade of combat troops and their support structure anywhere in the world is questionable. This issue, though, is beyond the scope of this study.[108]) Conventional forces will always need a means of emergency resupply,

and airdrop provides a superior means to meet this requirement. Additionally, special operations forces will continue to need a robust personnel and cargo airdrop capability, at least for the foreseeable future.

Most airdrop advocates do not live with their heads in the sand and they realize that airdrop, as a method of resupply, is *not* desirable if ground transportation or standard airlift is available and possible. However, to the ground commander that is completely cut-off from all other resupply avenues, the sight of CDS bundles floating to the ground with precious cargo can be propitious. The displaced and starving Kurds, Bosnians and Rwandans felt the same sentiments, certainly, as they saw humanitarian relief descending towards them from U.S. aircraft. It is unrealistic to believe that similar operations are not in our future.

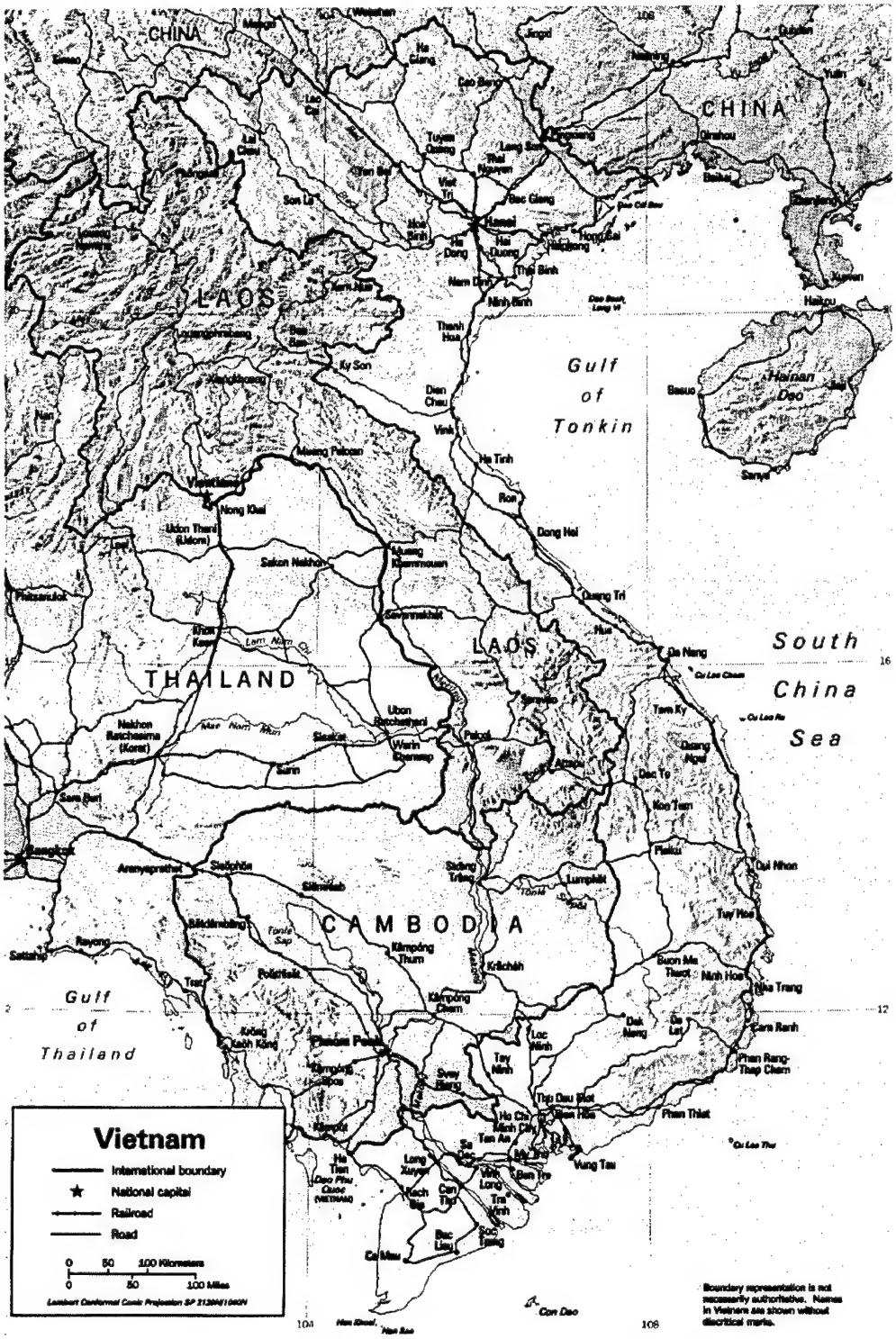
What is needed is airdrop doctrine, force structure and methodology that allows the U.S. to take full advantage of every means available to further its security interests. The combat developers have a serious obligation to scrutinize past operations to ascertain what critical lessons exist, and, if applicable, to incorporate them into the current techniques and procedures. This will enable our leaders and logisticians in the field to maximize our airdrop capabilities. Furthermore, today's security environment does not allow our military time to refine technology or develop doctrine after the requirement for it has been identified. If the use of airdrop is required, the situation is probably already desperate. The time for further testing and analysis is now. Logistics have been an afterthought of military planners for too long, and although this paradigm is changing, fields such as aerial resupply still suffer from neglect. Many of today's critics believe that light forces, in general, are outmoded, and there has been an undeniable emphasis on upgrading our heavy unit capability. However, one should not assume that a modern, high tech airdrop capability is solely for use by light forces. The new airdrop systems being designed have application across the spectrum: light, heavy, urban, peace operations, disaster relief, and so on.

As stated above, logistics is beginning to emerge as a combat multiplier worthy of more consideration. The Command and General Staff College has modified is curriculum dramatically in the last five years to place a much greater emphasis on the importance of the tactical logistics functions to battlefield success. Furthermore, strategic lift and transportation concerns have also moved to the fore of

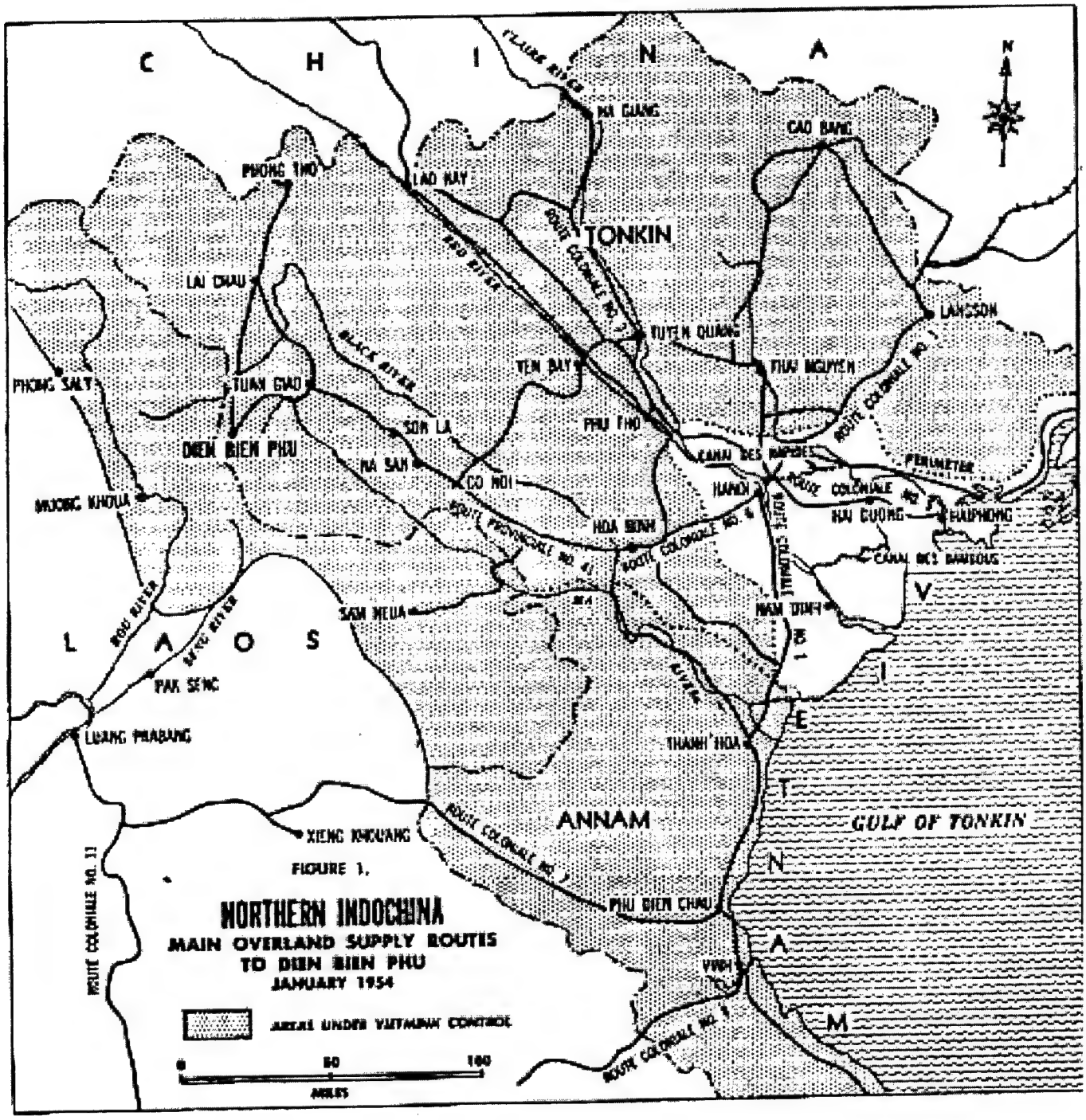
the College's instruction. The steps that have been taken are merely a beginning, however. The military profession has long espoused the virtues of studying history, but the overwhelming weight has been on the legacies of combat units and their strategy and tactics. Now it is time for our recognition of the importance of history and logistics to merge.

As this monograph has shown, at least in the case of airdrop, the Army has not adequately taken advantage of the lessons that were learned in such hard fashion by our predecessors in Vietnam. The airdrop community still does certain things extremely well, like interoperability with sister services and other nations, as well as displaying a knack for innovation under duress. But the harder technical, procedural and doctrinal issues were overlooked, never recorded or never studied.

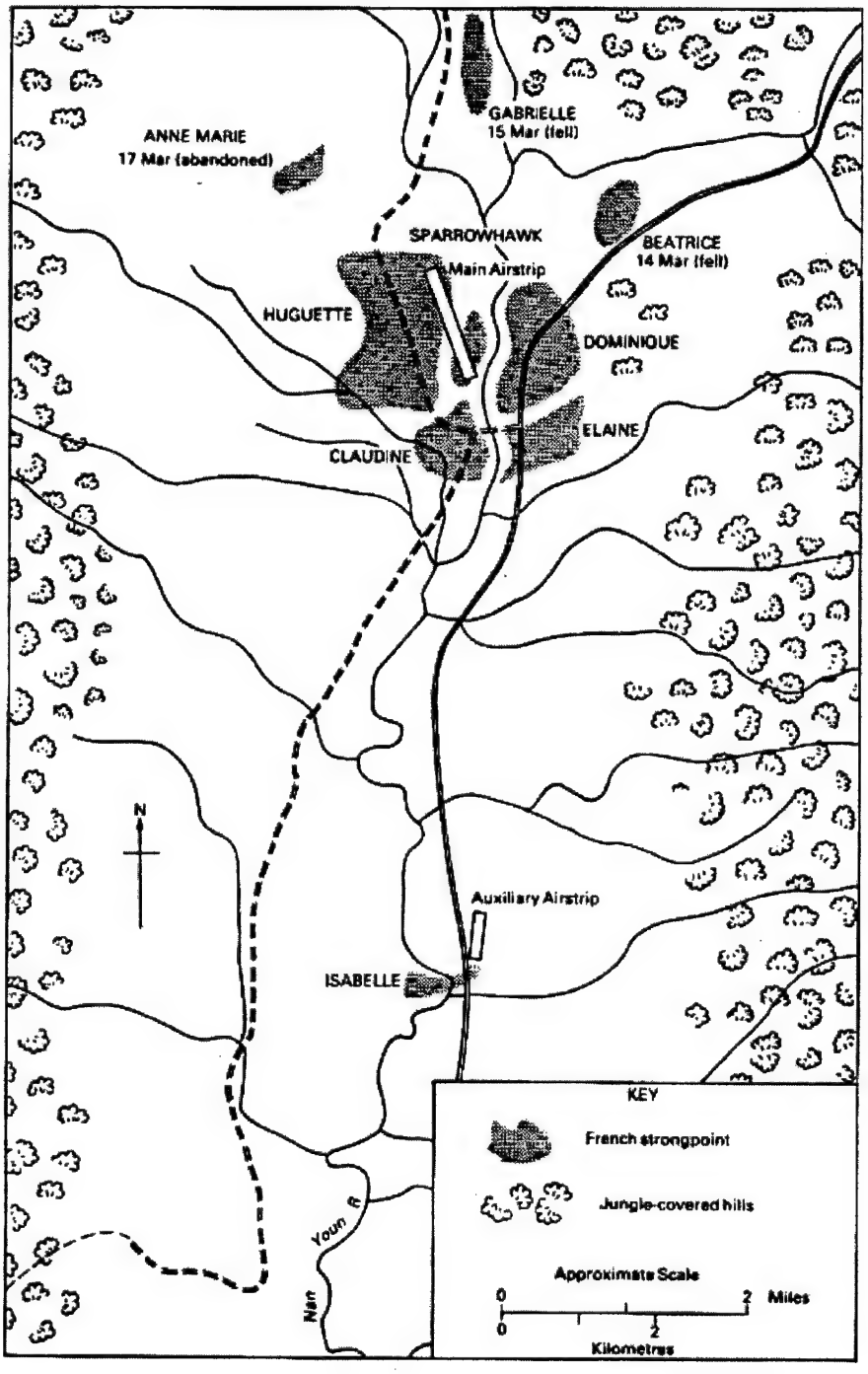
An anonymous piece of satire once stated that "Logisticians are a sad, embittered race of men, very much in demand in war, who sink resentfully into obscurity in peace."[109] Because many of today's military operations occur in "peace," logisticians, for better of for worse, never "...sink resentfully into obscurity...." Today's logisticians can better serve the commander, the soldier, and himself by acknowledging those vital lessons of conflicts past, and by learning from them.



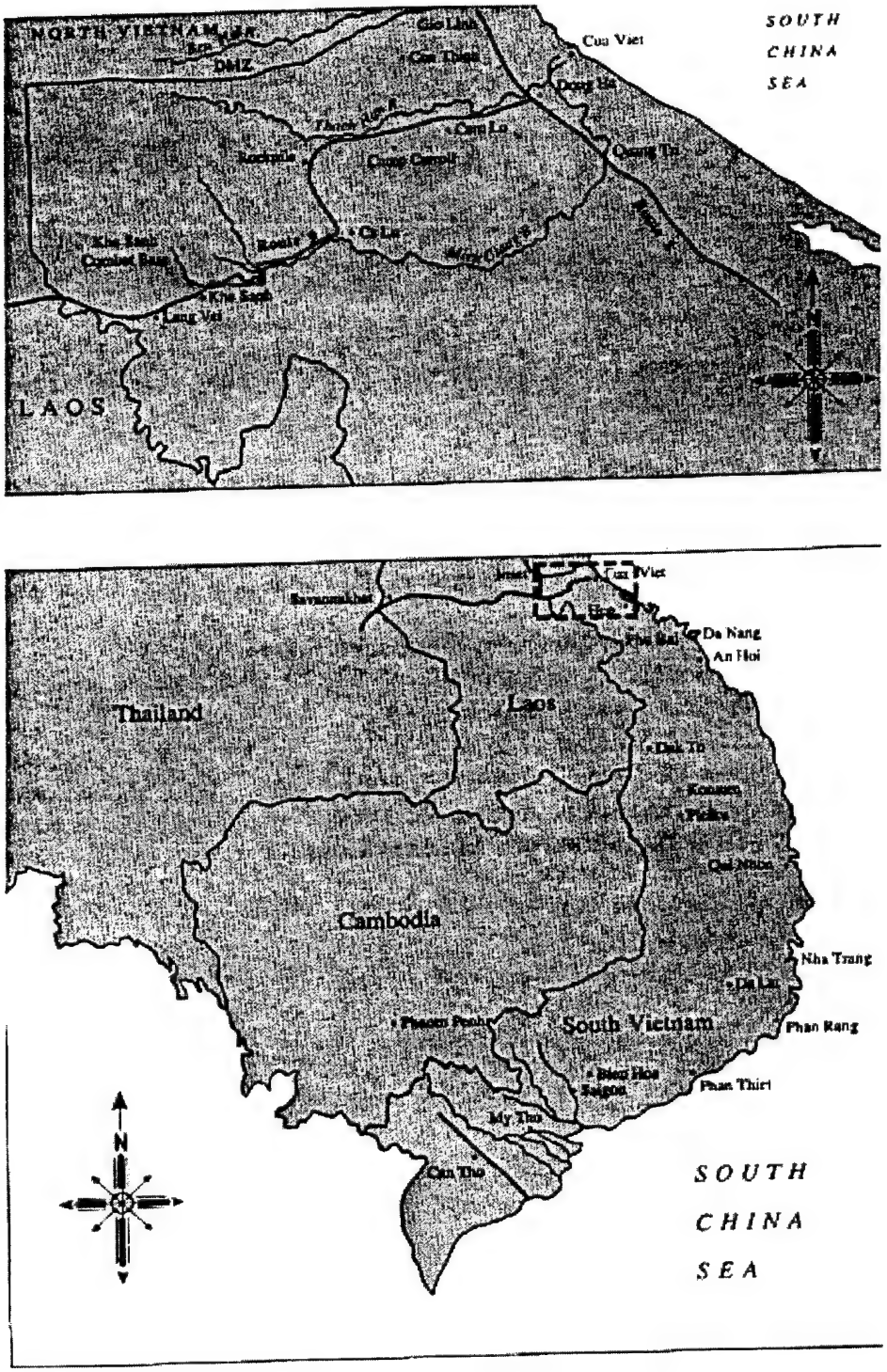
Appendix A: Vietnam



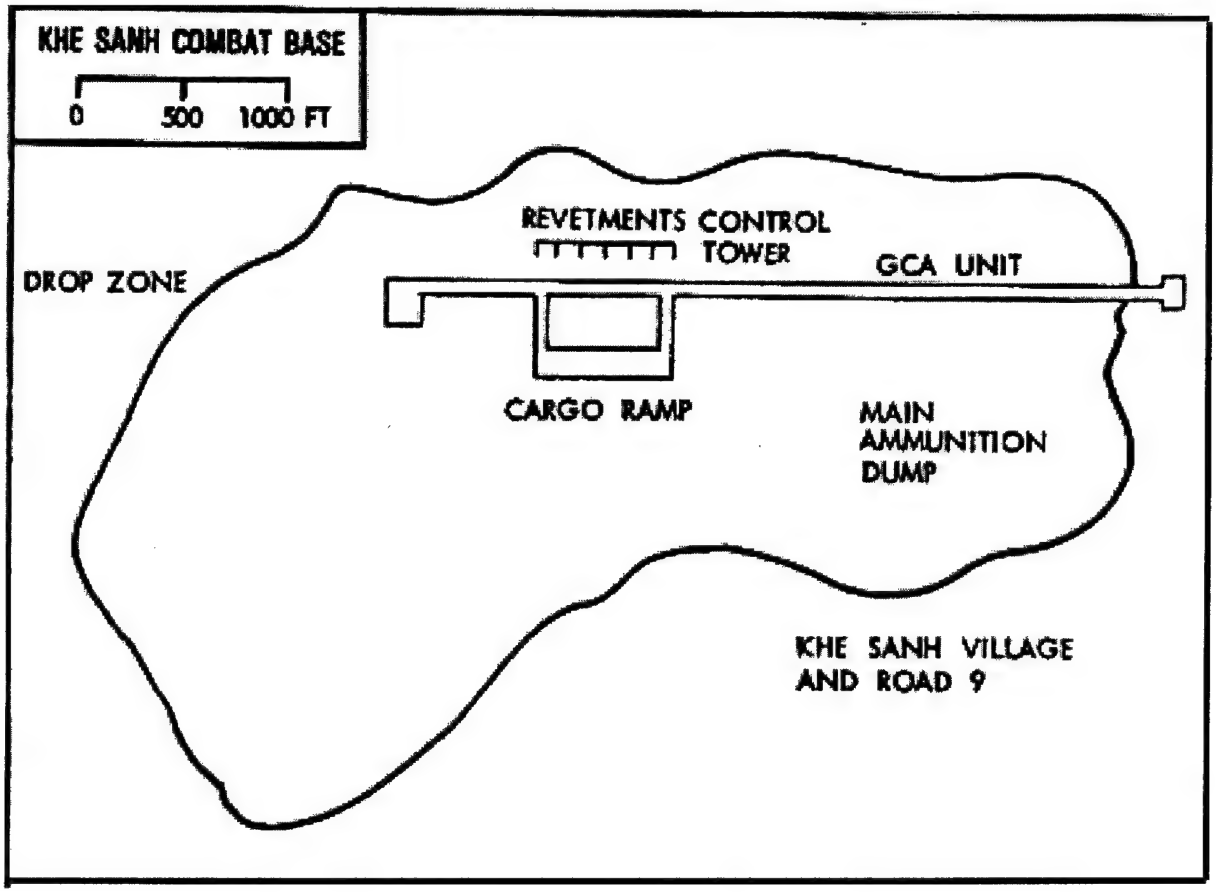
Appendix B: Northern Indochina in 1954. Reprinted from Norman E. Martin, "Dien Bien Phu and the Future of Airborne Operations," *Military Review* 36 (June, 1956), 23.



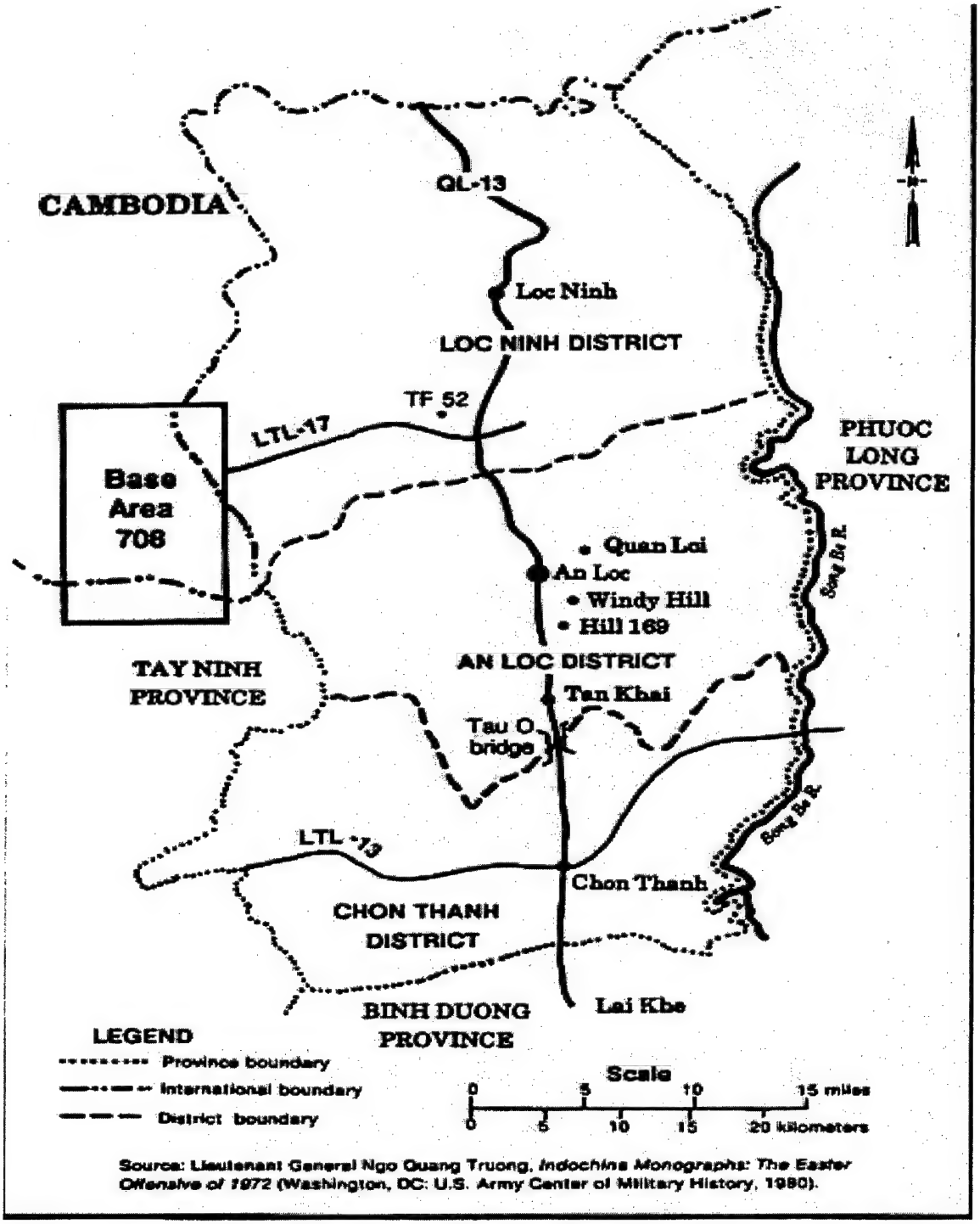
Appendix C: Dien Bien Phu, 1954. Reprinted from Julian Thompson, *The Lifeblood of War: Logistics in Armed Conflict*, (London: Brassey's. Ltd.. 1991). 178.



Appendix D: I Corps Sector, 1968. Reprinted from John Prados and Ray W. Stubbe, *Valley of Decision: The Siege of Khe Sanh,* (Boston: Houghton Mifflin Company, 1991), xii.

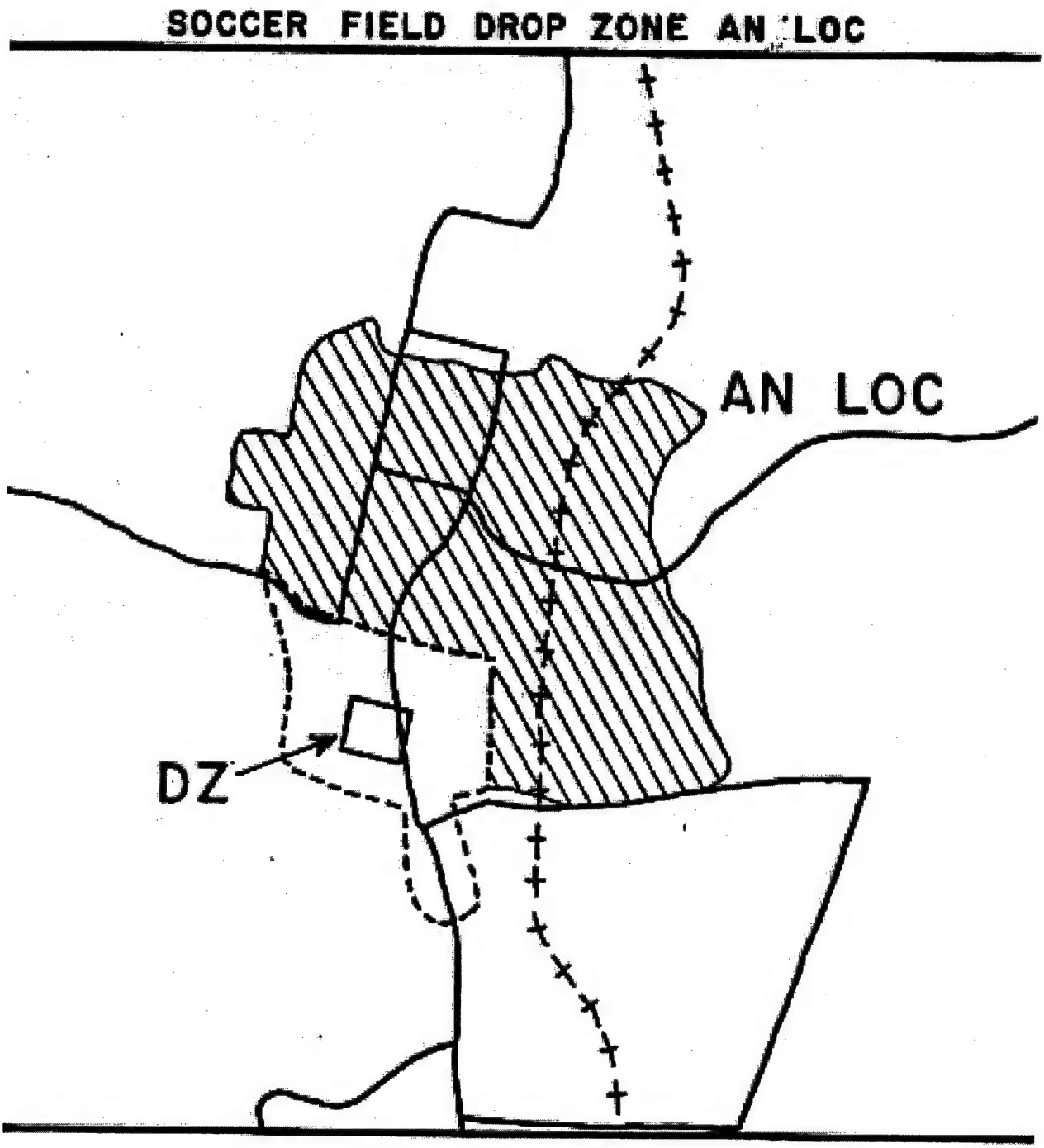


Appendix E: Khe Sanh Base. Reprinted from Ray L. Bowers, *Tactical Airlift*, (Washington, D.C.: Office of Air Force History, 1983), 298.



Map 2. Key locations, Binh Long Province, MR III

Appendix F: Tay Ninh Province. Reprinted from James H. Willbanks, *Thiet Giap! The Battle of An Loc, April 1972*, (Fort Leavenworth, Kansas: Combat Studies Institute, 1993), 6.



Appendix G: An Loc. Reprinted from Drew Middleton, *Air War—Vietnam*, (New York: Arno Press, 1978), 188.

NOTES

[1] Ardant Du Picq, *Battle Studies*, in *Roots of Strategy: Book 2*, (Harrisburg, Pennsylvania: Stackpole Books, Inc., 1987), 129-30.

[2] Martin Van Creveld, *Supplying War: Logistics from Wallenstein to Patton*, (New York: Cambridge University Press, 1977), 2.

[3] Chairman, Joint Chiefs of Staff, *Joint Publication 4-0: Doctrine for Logistic Support of Joint Operations*, (Washington, D.C.: 27 January 1995), I-6.

[4] Department of the Army, *FM 100-5: Operations*, (Washington, D.C.: 14 June 1993), v, 1-1.

[5] Ibid., 12-2. See also *FM 100-10: Combat Service Support*, (Washington, D.C., 10 February 1988); *Joint Publication 4-0*, II, 1-4; *Air Force Doctrine Document 40: Logistics*, (Washington, D.C., 11 May 1994), 8; Julian Thompson, *The Lifeblood of War: Logistics in Armed Conflict*, (London: Brassey's, Ltd., 1991), 7. Note that the new *FM 100-5* is scheduled for publication in 1999, and will probably prompt changes in the entire 10-series of Army manuals. However, airdrop will continue to adhere to the timeless logistical principles outlined in the joint publication.

[6] CJCS, *Joint Pub. 4-0*, II-1.

[7] Ibid., II-2, 3. See also *FM 100-10,* 1-2 to 1-5, and AFDD 40, 8-11.

[8] James S. Emery, "Airdrop Support to the Army," *Quartermaster Professional Bulletin*, (Spring 1991).

[9] Department of the Army, *FM 101-10-1/2: Staff Officers' Field Manual: Organizational, Technical, and Logistical Data Planning Factors, (Volume 2)*, (Washington, D.C.: 19 July 1990), 2-177 to 2-180.

[10] Department of the Army, *FM 10-500-1: Airdrop Support in a Theater of Operations*, (Washington, D.C.: 19 June 1991), 1-1, 2-4.

[11] Chairman, Joint Chiefs of Staff, *Joint Publication 3-17: Joint Tactics, Techniques, and Procedures for Theater Airlift Operations*, (Washington, D.C.: 18 July 1995), Chapter VI. See also *FM 10-500-9: Tactics, Techniques, and Procedures for Quartermaster Airdrop and Airdrop Support Units*, (Washington, D.C.: 3 October 1995), 1-1 to 1-8.

[12] Thompson, 185.

[13] Howard R Simpson, *Dien Bien Phu: The Epic Battle America Forgot*, (Washington, D.C.: Brassey's, Inc., 1994), xi. Simpson, a former U.S. Consul General, was an U.S. Information Agency correspondent during the First Indochina War, and spent time with French forces at Dien Bien Phu. Despite his first-hand account, however, the work lacks citations. This is all the more disappointing in a work of this magnitude, since Simpson claims to have had access to previously unreleased official French documents.

[14] Bernard T. Fall, *Hell in a Very Small Place: The Siege of Dien Bien Phu*, (Philadelphia: Lippincott, 1967), vii. Fall spent considerable time with French and then U.S. forces in Vietnam. He was killed while on patrol with U.S. Marines in 1967, less than one month after publication of this book. *Street Without Joy* is his other epic Vietnam account.

[15] Simpson, 47-8.

[16] Fall, viii-ix. See also Jules Roy, *The Battle of Dien Bien Phu*, (New York: Harper and Row, 1965.) Roy was an officer in both the French Army and Air Force. He resigned his commission just prior to the Indochina War, considering it "unjust and idiotic." Roy's work, along with Fall's *Hell*, are considered the benchmark studies of Dien Bien Phu.

[17] MACV, "The Battle of Dien Bien Phu: A Summary," (Saigon: Military History Branch, 11 February 1968), 2-6. This source was put together by Westmoreland's staff to assist in analyzing the siege at Khe Sanh. It is revealing in the sense that most of the facts are drawn from Fall's book, and little seems to have been hard data from French AARs, which were probably not made available to American sources in 1968. Whether they were sought is also unanswered.

[18] Ibid., 7-8.

[19] Fall, vii.

[20] MACV, "The Battle of Dien Bien Phu: A Summary," 16-17.

[21] Robert F. Futrell, *The United States Air Force in Southeast Asia: The Advisory Years to 1965*, (Washington, D.C.: Office of Air Force History, 1981), 18.

[22] Fall, 156.

[23] Futrell, 19.

[24] Ibid., 23-6. See also Thompson, 153-4: In the five months from October 1951 until February 1952, for example, "...the French received over 130,000 tons of equipment including 53 million rounds of ammunition, 8,000 vehicles, 200 aircraft, 3,500 radio sets, and 14,000 automatic weapons."

[25] Ray L. Bowers, *Tactical Airlift*, (Washington, D.C.: Office of Air Force History, 1983), 6-7.

[26] Supreme Command, Far East, *Enseignements de la Guerre d'Indochine: Fasicule II & III*, (Translation: *Lessons from the Indo-China War: Volumes II and III*), (31 May 1955). Despite the historical tendency of western armies to inject institutional bias into accounts of losing efforts, this is an honest, compilation of primary source reports and analysis; contains both tactical, operational and logistical concerns, and offers suggestions for improvement.

[27] Ibid., 10,19. Also see Futrell, 26-7.

[28] *Public Papers of the Presidents; Dwight D. Eisenhower, 1954*, (Washington, D.C., 1960), in Futrell, 16-17, 288. Also see Bowers, 15-16.

[29] MACV, "The Battle of Dien Bien Phu: A Summary," 11. Also see Thompson, 176.

[30] Bowers, 16.

[31] Thompson, 167-8.

[32] Supreme Command, Far East, 147-8, 152.

[33] Ibid., 176, and Futrell, (endnotes), 289-90.

[34] Supreme Command, Far East, 152-3.

[35] Ibid., 153, and Futrell, 26.

[36] Thompson, 176.

[37] Fall, 483-4, and Thompson, 185.

[38] MACV, "The Battle of Dien Bien Phu: A Summary," 11.

[39] *Joint Publication 4-0*, II-1-3.

[40] Bowers, 22-3. See also Thompson, 169.

[41] Supreme Command, Far East, 153. See also Battelle Memorial Institute, "Lessons to be Drawn from the War in Indo-China," 1954.

[42] Author's experience as commander of 5th QM Detachment (Airdrop Support) during Operation Provide Promise, 1993-95. It was the recurrence of the requirement for this procedure, and the lack of historical documentation that would have saved money and perhaps lives, that prompted the author's examination of this topic.

[43] R.F. Hooker, "Air Division (834th) in Vietnam 1966-1971," Student Report, (Maxwell Air Force Base, Alabama: U.S. Air Force Air Command and Staff College, April 1986), 11.

[44] Bowers, 295. Bowers, as noted in reference to Dien Bien Phu, was the single best overall source for airdrop data and airlift accounts of the Vietnam War. For Khe Sanh operations specifically, the sources of Nalty and McLaughlin also provided a very comprehensive airdrop picture. There are no definitive Army accounts of logistical events in support of Khe Sanh.

[45] Davidson, 495-6. See also Thompson, 201-3.

[46] Karnow, 541.

[47] Ibid., 540. See also Thompson, 203.

[48] Bowers, 295.

[49] John Prados and Ray W. Stubbe, *Valley of Decision: The Siege of Khe Sanh*, (Boston: Houghton Mifflin Company, 1991), 9-10, 25-26. Stubbe was a Navy chaplain who served at Khe Sanh. See also Moyers S. Shore, *The Battle for Khe Sanh*, (Washington: Historical Branch, G3 Division, Headquarters, U. S. Marine Corps, 1969), 8.

[50] Bowers, 295-7. See also Peter Brush, "The Joint Effort that Broke the Khe Sanh Siege," *Army* 47 (April, 1997), 46, and Claudius E. Watts, "Aerial Resupply for Khe Sanh," *Military Review* 52 (December, 1972), 82. Brush was a Marine who served as a heavy mortarman at Khe Sanh, Watts a veteran pilot in Vietnam and 1972 graduate of CGSC.

[51] William C. Westmoreland, *A Soldier Reports*, (New York: Da Capo Press, 3rd edition, 1989), 283, 337.

[52] Bowers, 297. See also Shore, 29. One of the two NVA divisions that was identified in the Khe Sanh area was the 304th, an elite home guard unit from Hanoi, which, ironically, had fought at Dien Bien Phu.

[53] Ibid., 301-2.

[54] Westmoreland, 339.

[55] Bernard C. Nalty, *Air Power and the Fight for Khe Sanh,* (Washington, D.C.: Office of Air Force History, 1973), 43-44.

[56] Ibid., 344.

[57] Burl W. McLaughlin, "Khe Sanh: Keeping an Outpost Alive," *Air University Review* (November-December 1968), 59-60. See also Bowers, 302.

[58] Bernard W. Rogers, *Cedar Falls-Junction City: A Turning Point,* (Washington, D.C.: Department of the Army, 1974), 101. Amazingly, a rigger with the 549th Quartermaster Company by the name of CW4 Howard P. Melvin made his fifth combat jump during this operation. As an infantryman in World War II, he had made combat parachute assaults at Gela, Sicily, Salerno and St. Mere Eglise.

[59] Carmelo Meletiche, "Annual Historical Supplement of the 109th Quartermaster Company (Air Delivery), 1 January 1966-31 December 1967," (Cam Ranh Bay, Vietnam: HQ, 278th S&S Battalion, 1968), 4-6.

[60] MACV, "The Logistics Review: U.S. Army Vietnam, 1965-1969, Volume II, (Saigon, 1970), A7-1, 2, 14. The Log Review was a comprehensive eight volume study of U.S. Army logistics conducted under the direction of the DCG, MACV, LTG Frank T. Mildren, and then MG Joseph M. Heiser, commander of the 1st Logistics Command. For such a high-level study, the level of detail, particularly concerning airdrop issues, is commendable.

[61] Personal correspondence with Colonel (Ret.) A.B. Lanier, who commanded the 109th QM Company during much of the Khe Sanh operation, and Specialist Five Ray Anderson, also a member of the unit, now a municipal judge in Texas. Colonel Lanier provided me, along with much other information, a copy of the unit history referenced above. Mr. Anderson has established a comprehensive web site about the history of airdrop in Vietnam: http://www.globalfrontiers.com/ 109thad/. Both of these men have been invaluable sources of information during my research.

[62] Ibid.

[63] Bowers, 303. See also Brush, 48, Hooker, 10, and McLaughlin, 60.

[64] MACV, "The Logistics Review," A7-3,4. See also Brush, 48, and Watts, 87.

[65] Bowers, 311.

[66] Ibid., 311-12. See also McLaughlin, 63-4, and Brush, 48.

[67] Hooker, 10. See also McLaughlin, 59-62 and Bowers, 316.

[68] Bowers, 312, 314. See also McLaughlin, 67 and Watts, 86.

[69] McLaughlin, 69, 72-3, 76-77.

[70] Bowers, 316.

[71] Dale Andradé, *Trial By Fire,* (New York: Hippocrene Books, Inc., 1995), 456.

[72] James H. Willbanks, *Thiet Giap! The Battle of An Loc: April 1972,* (Fort Leavenworth, Kansas: CSI Publications, 1993), 1.

[73] Ibid., 3-7. See also Thompson, 213.

[74] Ibid., 7, 13. See also Directorate of Operations Analysis, Headquarters, Pacific Air Force, *Contemporary Historical Examination of Current Operations (Project CHECO) Report: The Battle for An Loc, 5 April-26 June 1972,* (HQ, PACAF: Honolulu, 1973), 2,5. This Project CHECO report was the definitive airdrop resource for the Battle of An Loc.

[75] Project CHECO Report, 16. See also Willbanks, 14-21, 24.

[76] Willbanks, 25-28.

[77] Project CHECO Report, ibid., 24-26. Medical and sanitation conditions would eventually get so severe that the Air Force was airdropping lime for use in mass graves.

[78] Ngo Quang Troung, *Indochina Monographs: The Easter Offensive of 1972,* (Washington, D.C.: U.S. Army Center for Military History, 1980), 124-5. See also Willbanks, 24, 37-38, and Project CHECO Report, 26-8.

[79] Bowers, 551.

[80] Drew Middleton, *Air War—Vietnam*, (New York: Arno Press, Inc., 1978), 184-5. See also Project CHECO Report, 28-29.

[81] Willbanks, 43-4.

[82] Bowers, 547.

[83] Troung, 126-28. See also Andrade, 447.

[84] Middleton, 189.

[85] Ibid., 186. See also Project CHECO Report, 29-30 and Troung, 125.

[86] Ibid., 188.

[87] Bowers, 546.

[88] Ibid., 547.

[89] Middleton, 189. See also Project CHECO Report, 35.

[90] Bowers, 548. Also, discussions with LTC (Ret.) Willbanks revealed that riggers from the 549th on at least one occasion made their way into An Loc in an attempt to recover some of the rapidly dwindling air items.

[91] Project CHECO Report, 35-6. See also Bowers, 548 and Middleton, 189.

[92] Bowers, 548-9.

[93] Ibid., 550. See also Project CHECO Report, 35-6.

[94] Project CHECO Report, 36.

[95] Bowers, 550-1.

[96] Ibid., 554. Presumably, the Army research facility mentioned here was Natick Laboratories in Massachusetts. This is where new airdrop research for the Army is being carried out today. However, their historical records, like most of the Army's logistical history, are incomplete, and do not contain any references to An Loc. Engineers at Natick were instrumental in developments during the Bosnia airdrop mission, as will be shown in Chapter 6.

[97] Ibid., 554-6.

[98] Willbanks, 61.

[99] Bowers, 556-7.

[100] President William J. Clinton,

[101] Airborne and Field Services Department, U.S. Army Quartermaster Center and School, "Aerial Delivery Developments" briefing slides, (Fort Lee, Virginia, 1998). Also, conversations with the Director of

Airborne and Field Services Department, Mr. Ted Dlugos; he and his staff were extremely helpful in researching this monograph.

[102] Ibid.

[103] Ibid.

[104] Author's experience as commander of the 5th QM Detachment from December 1993 until March 1995. During this time over 30,000 individual loads of humanitarian assistance were dropped into the former Yugoslavia. Although the mission was a logistical success, it came at a tremendous cost to Army war reserve stocks, and Air Force operational readiness (OR) rates. See related articles in the Quartermaster Professional Bulletin, Summer and Autumn, 1993, and Autumn, 1997.

[105] Ibid.

[106] Correspondence with Mr. Ted Dlugos, Director, Airborne and Field Services Department, November, 1998.

[107] A.J. Bacevich, *The Pentomic Era: The U.S. Army between Korea and Vietnam*, (Washington, D.C.: The National Defense University Press, 1986), p. 153-54.

[108] For an interesting study of the requirement for strategic brigade airdrop and the implications of realistically maintaining such a capability, see S.R. Hannah and E.J. Ronsick, "Airland Battle and Combat Airdrop Doctrine and Requirement," Student Monograph, (Maxwell Air Force Base, Alabama: U.S. Air Force War College, 11 April 1988).

[109] Charles R. Schrader, *United States Army Logistics, 1775-1992: An Anthology*, (Washington, D.C.: Center of Military History, 1997), 811.

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